There Is Nothing to Be Afraid of

THE delegates to the Fall Conference of the Paper Industry have come flocking in from all parts of the United States, in larger numbers, and earlier than ever before. By 10 o'clock Monday morning the lobby of the Drake Hotel was filled with mill men and jobbers eager to discuss the present situation. It developed early in the day that in the minds of the jobbers, and they in turn speaking for the consumers, voiced a fear which they claimed existed in the minds of the consumers, that the new tonnage of paper coming on the market, particularly Kraft, would not be absorbed.

In answer to this, the mill men immediately began giving the assurance that there would be no trouble whatever. The reason for the wide-spread existence of the fear lies in the fact that the producers and jobbers have been thinking in the past tense of production, and neglecting the present and future tense of consumption. The consumption of paper in the United States is rapidly growing because of the increase in population; the per capita consumption of paper is likewise growing.

The population of this country has increased 16,000,000 since 1914, an average increase of 1,750,000 persons per year. This is an increase of 21 per cent in population. In 1909 we consumed 4,000,000 tons of paper in round numbers; in 1922, 7,000,000 tons; this is an increase of 75 per cent. The consumption in 1909 was 90 pounds per capita, and in 1922 it was 127 pounds per capita, or an increase in per capita consumption of 51 per cent.

Now the increase in population is going on at the rate of 1,750,000 per year, and it is thus necessary to provide 127 pounds for each additional person per year, making a total of 111,000 tons per annum.

It has been stated by statistical authorities that the increased paper production of Kraft will amount to 250 tons a day, or 75,000 tons during the coming year, but the total increased consumption will equal 111,000 tons, so that leaves us a margin to be provided either with Kraft or some other grades.

It is really remarkable how the figures check up when we refer to the production statistics.

The United States is the largest producers of chemical pulp in the world. In 1922 we produced 2,038,000 tons, but that was insufficient because we imported from foreign sources 932,000 tons of chemical pulp during the same year. In 1914 we imported 320,000 tons of chemical pulp, so in 9 years we have increased our imports of chemical pulp 300 per cent, the increase figuring about 110,000 tons per annum, keeping pace almost exactly with the increased per capita demand.

The question before the paper industry is not "Have we more paper than we can use?" The real question is "Where is the paper coming from to take care of the future needs of the people of the United States?"

We have reached the limits of our forest production. We have used all the wood that we can produce this year so far in the first seven months. We have imported 824,050 cords of pulp wood from Canada, and have also imported 620,000 tons of chemical pulp and 156,000 tons of ground wood. "What is there to be afraid of?" Just one thing—not that we shall over-produce in America; but where is the paper coming from?

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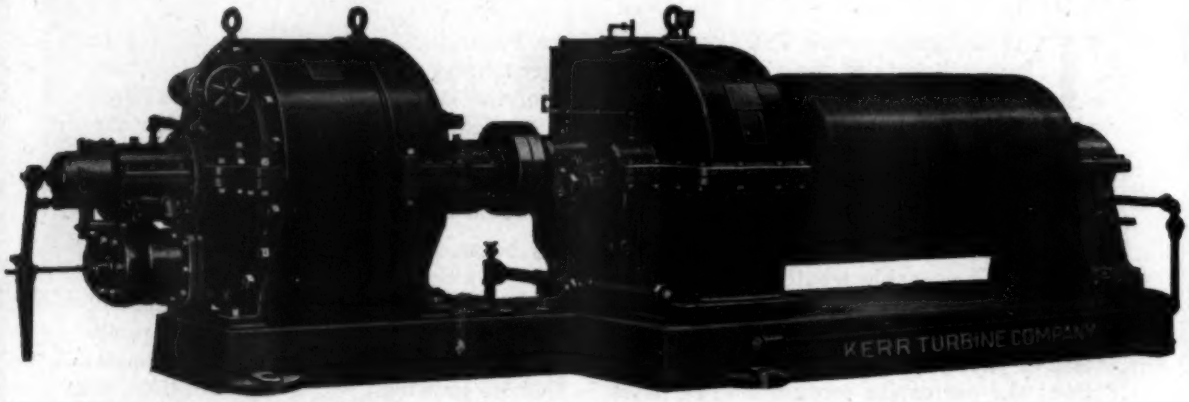

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Gilbert Paper Co., Wis.
Harmony Mills, N. Y.
Hinde & Dauch Paper Co., Iowa.
International Paper Co., N. Y.
Jarvis Paper Mills, N. H.
Kimberly Clark Co., Wis.
Minnesota & Ontario P. Co., Minn.
Mountain Mill Paper Co., Mass.
Mead Pulp & Paper Co., Ohio.
Marinette & Menominee P. Co., Wis.
Nekoosa-Edwards Paper Co., Wis.
Ontario Paper Co., Inc., Ont.
Oswegatchie Paper Co., N. Y.
Pride Pulp Paper Co., Wis.
Peshtigo Paper Co., Wis.
Richardson Co., Ohio.
River Raisin Paper Co., Mich.
St. Clair Paper Co., Ind.
St. Regis Paper Co., N. Y.
Spanish River Pulp & P. Co., Ont.
Southern Paper Co., Miss.
West Jersey Paper Co., N. J.
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An Office in Chicago

A MOVE in the right direction, and one that seems to be of tremendous importance to the pulp and paper industry of America, was made at the meeting of the Woodlands Section recently held in Chicago.

This move is no less than a suggestion, made by a prominent man in the industry in northern Wisconsin, that either a branch office of the Woodland Section of the American Paper and Pulp Association, or the main office of the Section itself, be located in Chicago, with secretary O. M. Porter in charge.

Among the definite purposes of the Woodlands Section, as outlined in the articles of organization, are the following:

1. "To increase the efficiency of the woods operations of the pulp and paper industry.

2. "To encourage the practice of forestry on timberland holdings.

3. "To provide a medium for the gathering and dissemination of information which will promote the permanency of the woods operations of the pulp and paper industry."

There is no question but that the Woodlands Section has performed a great service in the pulp and paper industry of the United States, since the original organization meeting was held in Chicago, in November, 1920, and it has already accomplished enough remarkable results to establish its importance in the minds of the industry as an essential body.

There is a feeling, however, that while the Section accomplishes certain definite purposes, it isn't doing half as much as it might do. We believe that all is being accomplished that the limited amount of money available will allow it to do, but by coming into closer contact with individual companies, we believe a more direct service can be performed at little if no additional expense.

The suggestion that the Woodlands Section office be moved to Chicago, was but an added expression of one which has been made before.

It has been a feeling for some time that there are enough members of the American Paper and Pulp Association, who are closer to Chicago than they are to New York, who are helping to keep the American Paper and Pulp Association alive, to warrant having an assistant secretary in Chicago to handle those affairs which demand close contact on the part of some one located nearer to the mills in that part of the country.

We are in perfect accord with such a thought, and believe that an assistant secretary of the American Paper and Pulp Association, located in Chicago, could be of the greatest help and benefit to all branches of the parent body. He would be in a position to give immediate and active co-operation not only to the members of the Woodlands Section in the central states, but also to the four working bodies—the Superintendents' Association, the Technical Association, the Cost Accountants and Salesmen. Such an office would have the opportunity to bring together in a more co-operative and united effort the workings of all of the active branches of the American Paper and Pulp Association.

It is true that there has always been a feeling among a certain element in the industry that the American Paper and Pulp Association has devoted its main efforts to the eastern section of the country, but we do not believe that there has been any thought of this in the minds of the officers.

An office in Chicago, however, with a man like Mr. Porter in charge of it, would do much to overcome this thought in the minds of many manufacturers. It would broaden the work of the Association and, we think, be more helpful to the industry as a whole.

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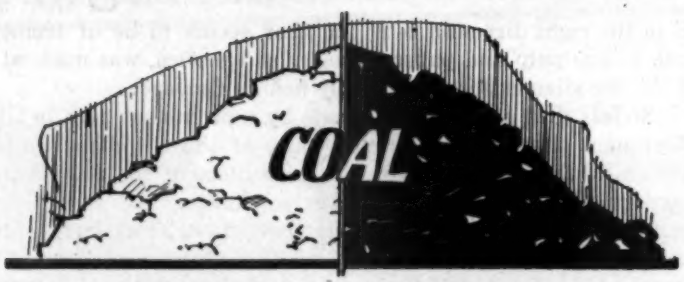

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THE PAPER INDUSTRY

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The Road to a Permanent Timber Supply

By RALPH S. HOSMER

Professor of Forestry, Cornell University President, Society of American Foresters

THAT the supply of coniferous timber in the United States, including pulpwood, is being rapidly diminished is no news to the readers of THE PAPER INDUSTRY. But perhaps it is not so evident how we as a nation can take effective steps to meet this situation. The appearance in recent months of two official publications dealing with this question gives point to a consideration of the subject. The purpose of this article is briefly to recount the outstanding facts, to comment on certain current proposals that have for their object the assurance of a permanent timber supply, and to suggest means by which those interested can help to further these projects.

In the Yearbook of the U. S. Department of Agriculture for 1922, issued in June 1923, is an article prepared by the U. S. Forest Service, entitled "Timber: Mine or Crop?", which presents the latest available statistics as to the timber supply of this country. The article has been reprinted and may be obtained in that form from the Forest Service at Washington. It supplements the so-called "Timber Depletion Report" made in response to Senate Resolution 311, on June 1, 1920 and presents additional data that have become available since that time. It is an authoritative statement from the Bureau of the Federal Government best qualified to speak on this topic. The statistics quoted in the present article are mainly from that source.

The other contribution is a much more pretentious work, a book in two volumes entitled "The Forest Resources of the World" by Messrs. Raphael Zon and William N. Sparhawk, published by the McGraw-Hill Book Co. of New York, in the early summer of 1923. The authors are both Forest Service men; Mr. Zon, the Director of the recently established Lake States Forest Experiment Station, with headquarters at St. Paul, Minnesota. Although not technically an official publication, this book was published with the cooperation and sanction of the Forest Service and represents its point of view. It gives, for the first time, a comprehensive presentation of what the timber resources of the world are, and of where they are located. Both are contributions that should be known to those whose industries depend on the use of wood.

The significant points brought out in the Yearbook article are: (1) The salient facts in relation to the diminution of our American timber supply, both as regards softwoods and hardwoods, and the results that have followed our treating the forest as a mine, rather than as a producer of successive crops, (2) The relation that the location of the existing supply bears to the cost of all forest products to the consumer. Very soon our only remaining stands of original forest will all be in the Pacific Northwest; (3) The fact that there are now in the United States great areas of waste land, useful only for the production of forests, but now lying idle, which might if rightly managed insure to us a permanent timber supply.

Americans are the greatest wood users among all the nations. Our per capital consumption is 212 cubic feet per annum, as compared with an average of about 35 cubic feet for Europe. We use annually about 2/5's of the total world consumption; nearly half of the world's consumption of saw timber; more than half the paper, and nearly 1/3 of the world's consumption of fuel wood. Because wood has been cheap and accessible we in America have been able to enjoy comforts and conveniences as have the people of almost no other country. To maintain the standards of living to which we are accustomed requires that we have a continuous supply of timber and of wood. The forest is the only source of this supply, and furthermore, only from North American forests can we expect to obtain the quantities and the kinds of timber which we require.

What is the present status of our timber supply? The Yearbook article says: "Coniferous saw timber is being removed from our forests 8½ times as fast as it grows, hardwoods 4 times as fast. The only

reasons that the present cut can be maintained for the time being is that the virgin timber from which the bulk of the cut is now derived represents, like coal deposits, an accumulated growth of centuries." For the country as a whole the amount of wood annually taken from the forest is four times the replacement by growth.

The Transportation Problem

With the shifting of the center of the lumber industry from New England, through New York and Pennsylvania to the Lake States, then to the south and now to the Pacific Coast, the problem of transportation has steadily grown to be more and more of a factor. Not only does the long haul increase the price which the consumer has to pay for lumber, and reduce the quality of what he can purchase, but also high lumber prices increase the cost of a vast number of other commodities. Even in the one item of containers, alone, be the packing cases of wood or of paper (another form of wood), the rising prices of the raw material directly affect the cost of the products shipped.

Seventy-five and eighty years ago short hauls were a characteristic feature of the lumber industry. From the Maine forests to Boston the distance was around 225 miles; from the upper Hudson Valley to New York City less than 200. In the Lake States operations, from 1870 to 1900, the distances to which lumber was moved began to run up. Many middle western markets were over 500 miles distant. From Saginaw to New York is approximately 1,000 miles. But these distances are small as compared with those from the Pacific Coast. By water Puget Sound is nearly 7,000 miles from New York. By rail Omaha is nearly 2,000 miles from Portland; Chicago is 2,300 and New York is 3,200 miles. The pre-war water rates of $12 to $16 per thousand feet from Puget Sound to the Atlantic Coast are now approximately 25 per cent higher and the pre-war rail rates of $12 to the Middle West and $20 to New York have jumped respectively to $17.50 and $25.00. These figures of course apply primarily to lumber. The situation as regards the diminishing supply of pulpwood in the Northeast is too well known to need comment here.

High prices are, however, only a part of the story. The exhaustion of the forests that supply a local wood-using industry leads necessarily to the closing down and removal of the mills. In communities where the industries dependent on the forest were the principal industries, the inevitable result is stagnation and retrogression. The evil effects that result economically and socially from this process have so far received but scant attention from the general public, but one does not have to search far to discover how serious and far reaching are their consequences. An ample, permanent, and easily accessible timber supply is a controlling factor in the economic prosperity of this or any other country.

End of Timber Supply in Sight

From their study of the forest resources of the world, Messrs. Zon and Sparhawk find that the solution of the timber supply problem does not lie in importation of timber and of wood from other countries. To some extent, of course, we can depend on this source of supply, as we are now doing to a considerable extent as regards the importation of pulpwood from Canada. But this is at best a temporary expedient. The Canadian forests are no more inexhaustible than were our own. The end of the supply is in sight north of the international border just as it is south of that line. As regards forest resources Canada and the United States are in the same boat. It is for this reason that no permanent solution would be effected by repeating in the Dominion the rapid and ill considered exploitation of the forest that has characterized the United States. Ours is a record for which all of us are to blame. As a nation we did not wake up soon enough to our needs for the future. But to repeat that process in Canada now would only be to rock the boat.

Two-thirds of all the timber consumed in the United States as well as the bulk of the pulpwood, comes from coniferous trees—the pines, spruces, firs and hemlocks. The coniferous forests of the world lie practically altogether in the North Temperate Zone in the belt that crosses Northern America, and extends from the Scandinavian peninsula eastward across Northern Russia and Siberia, with some extensions southwards, as in our own Gulf States and in Central Europe. The demands of the European countries, augmented by the period of reconstruction necessitated by the World War, will absorb a large part of the product of the forests of that continent. Were we to compete in that market it could but be at excessive prices, to say nothing of the added costs of transportation. Even more is this true of what Siberian timber may eventually find an outlet to the Pacific. With the industrial awakening of the Orient that appears inevitable, would follow competition from China and Japan. And even if it were economically possible, the quantity available for annual export would amount to but a small part of our present consumption.

Reforestation Only Solution

The forests of the tropics consist essentially of hard woods, not of conifers. Valuable as are these store houses of timber they do not contain the kinds of trees that are most in demand for the uses of construction, paper making and general every day needs. In a paragraph in the Yearbook article Mr. Zon thus sums up the situation:

"The timber needs of the United States are so enormous that it is inconceivable that they can be

supplied, except in small part or at excessive prices, by importation from other countries."

What then is the solution? To this question the unescapable and only satisfactory answer seems to be, the production of forests within our own country on lands that are unsuited to other use; in other words the practice of forestry on a nation-wide scale.

Originally nearly half the land area of the United States was under forest; some 822 million acres. This original forest has now been reduced to a total of slightly under 470 million acres, made up as follows: 138 million acres of virgin forest (75% of which is west of the Great Plains), 250 million acres of culled forest and second growth, and 81 million acres of unproductive land, that is not restocking naturally with forest. The great bulk of the present forest land of the United States is not suited for agriculture, and could be made to produce agricultural crops only at high, or excessive cost. But it can be made again to grow forests. As it is now only a small part of our potential forest area is being given adequate protection and systematic care. As has already been said, the country as a whole is being subjected to an annual drain that is over four times the replacement by growth. The key to the problem lies in re-establishing productive forests of valuable species. The answer may be summed up in the slogan, "Make the idle acres work."

The United States uses each year about 22.5 billion cubic feet of wood; equivalent to 53 billion feet, board measure. The cut of lumber alone amounts to 37,700,000,000 feet, board measure. Expressed in percentages, the principal items may be grouped as follows: Fuel wood 42.4, sawed timber 36.8, other forest products 20.8. If to the above mentioned total are added the amounts of wood destroyed annually by fire, insects, disease and windfall, the grand total of the drain on the forest comes to 24.7 billion cubic feet.

"For the country as a whole the cut of pulpwood constitutes 2.6 per cent of the total cut, and 4.5 per cent of the total softwood cut. But in the Northeast, the present center of the pulp and paper industry, the consumption of pulpwood (spruce and balsam) equals 76 per cent of the entire cut of spruce." This but emphasizes the desirability of having a dependable, permanent source of supply located near the established seat of the industry. Eventually a major share of the timber and wood needed in the Eastern States should be produced in this portion of the country.

Methods of Insuring Timber Supply

To meet the demand for an assured timber supply the people of the United States must do several things. First we must stop the losses that occur annually from forest fires. Next we must, so far as is practicable, reduce the wastes that occur all the way from the stump to the completion of the finished product. Some of these wastes can be checked at once; others as changing economic conditions permit closer utilization, including the use of material that now often has to be left in the woods. But particularly we must put the forest land of the country to work growing more trees.

From the experience of other nations, in which the forests are under systematic management, we know that it is possible to more than double the amount of wood that is now produced per year on the 250 million acres of productive second growth forest in the United States. The average growth per acre per annum on this land is now 24 cubic feet. Based on data on the growth of American trees that are now available, it is estimated that under intensive forestry our entire forest area could be made to produce on the average about 58 cubic feet per year to the acre. If all the forest land of the country were thus put to work—the virgin forest, the cut-over areas and the now unproductive waste land—in all 470 million acres, there would be a total yield annually of 27 billion cubic feet, i.e., the total would exceed the present total annual drain on our forests by approximately 2 billion cubic feet. Rightly used there is sufficient forest land in the United States to supply the needs of today, at the present rate of consumption. With savings that can be effected through the prevention of waste, we could supply a much larger population than we now have.

Obviously such a program of intensive forestry can not be brought about over night. Its accomplishment at best can only be through gradual development. The sooner it is undertaken in earnest, the shorter will be the inevitable period of timber scarcity on which we are even now entering. The effects of a famine are felt long before the last sack of flour is reached, or the last stand of timber cut. There is no clearer evidence needed than that today the people on the Atlantic Coast are paying more for freight on a thousand feet of Pacific Coast lumber, than that lumber itself costs in west coast markets. Every year that we delay in making provision for a permanent timber supply but accentuates the evils that cannot but result from a continued shortage. This problem is one that has got to be faced and solved. The need is imperative. The time to act is now.

It is not within the province of this article to go into the controversial matters as to what may justly be expected of private owners of forest lands in the way of keeping their forests continuously productive, nor to discuss the question of whether or not the ownership of forest land carries with it certain implied obligations. But it is instructive for us to note that in France, a country no less individualistic than our own, the people have willingly submitted for almost a century to a code of forest laws that regulate the use of privately owned forest land in a manner that we should deem drastic. France found that

it could not get on without wood. Its forest code is the expression of that experience.

Forest Raising, a Paying Investment

Personally it is the feeling of the writer that the rapidly changing economic conditions regarding our timber supply will soon make, in certain parts of the country at least, the growing of commercial forests a business proposition that will appeal favorably to those who are willing and able to invest capital in an investment that must confessedly run over a considerable period of time. In the case of permanent corporations, and especially of pulp and paper companies, that time may not be so far distant as some now seem to think. In some parts of the country, especially in New England, the raising of forests has already been proved to be a paying investment. As the years go by this cannot fail to be true of other regions as well.

But in the meantime there are certain things that can be done, about the desirability of which there is no essential difference of opinion among any of those who have given this matter serious thought. First comes the prevention of forest fire. The results obtained in forest fire control on the National Forests and on certain state forests demonstrate absolutely the practicability of this work. It is by no means the whole of forestry—a point not always fully appreciated—but it is the essential first step. Fortunately, in many parts of our country, we can, provided fire is kept out, depend on natural reproduction for the beginning of a new forest. The prevention of forest fire is a need about which there can be no question.

Next, if we would but harvest our remaining virgin timber with thought of the future as well as merely of the immediate yield, we could add a large area to the land to which we must look for subsequent crops. "Forestry is the perpetuation of the forest through wise use." The forester's ideal is to harvest successive crops, increasingly better in quantity and quality, from a given area. When he speaks of "sustained yield" he means regulation of the cut so that no more shall be removed from a forest at a given cutting than has been produced by nature since the last previous cut. This is the principle upon which all forestry practice rests, the world over. The forest is a natural resource that, if properly handled, renews itself.

Third, we can begin the task of replacing through planting those denuded areas and waste lands where a valuable forest will not come back, save by the aid of man. Contrary to the opinion of not a few persons, the forester does not resort to planting if he can get results from natural regeneration. Greater cost at the outset is a powerful deterrent, but there is much waste land, capable, however, of growing perfectly good forests, that can be reclaimed and put to use in no other way. Consequently forest planting plays no small part in forestry operations.

And finally, there is need for the development of more scientific and technical knowledge about our American forests than we now have. European forestry practice deals with little more than a dozen species of trees. In America out of a total of over 500, we have at least 200 kinds of trees that may be ranked as commercially important. To develop the best methods of practice and forest management we need a knowledge of our forests comparable to that we now have of our agricultural crops. It takes time to gather information of this sort and much study by specially trained men. Scientific research must precede the development of truly satisfactory methods of silviculture and forest management.

Committee on Reforestation

But, it may be asked, where does the public come in, in this program, and the man whose industry depends upon the products of the forest? Very definitely, in seeing to it that work is undertaken in each of the directions enumerated above, and that means are provided for their prosecution. Specifically, perhaps the greatest need at present is for federal and state legislation authorizing forestry work and making appropriations therefore. A Senate Committee on Reforestation has been holding hearings all over the country since the adjournment of Congress last spring. It is to bring in a report next April which it is to be hoped will emphasize the things of immediate importance in forestry, and indicate how they may be accomplished. At the last session of Congress the Clarke bill (H. R. 14,241), so called from its introducer, Representative John D. Clarke of New York, concentrated attention on five cardinal points. These were (1) adequate protection of our forests from fire; (2) the extension of public ownership in forests; (3) the study of the problem of just forest taxation, with the purpose of substituting for the unsatisfactory general property tax a just tax based on the principle of taxing the yield of the forest; (4) a plan, through co-operation between the Federal Government and the individual states, for giving assistance to forest land owners in the establishment and management of forests, both by making forest nursery stock easily available for forest planting and by additional facilities for advice and assistance in the proper management of existing woodlands; and (5) the prosecution of forest research, especially by and through Forest Experiment Stations, operated by technically trained men under the Forest Service of the U. S. Department of Agriculture.

The above five items by no means constitute the whole of forestry, nor will our national problem have been solved until the practice of intensive forestry becomes general throughout the United States. But they are all things for which there is at present particular need. The most effective way in which the

movement to insure a permanent timber supply for our country can be furthered is for each corporation, each company and each individual who is interested in our forests, to get behind such measures and to give them his hearty and energetic support. In a country run as is ours, well informed public opinion is the most potent lever with which to get things done. Everyone who desires to see the foundation laid for a permanent timber supply should post himself as to the facts and then actively support measures of the character of the Clarke bill. For the individual the most effective way to help is to ally himself with recognized organizations that head the forestry movement, the local State Forestry Association, and the national body, the American Forestry Association.

Summary

Forestry is as yet relatively young in the United States. So far in our National forest policy, the emphasis has been laid on the organization and administration of the National Forests. We now need to go further and to add a new chapter to that policy whereby the forestry work of the states may be strengthened, and especially where, through co-operation between the Federal Government and the states, the practice of forestry on privately owned forests, both large and small, shall be made possible and encouraged. This does not mean that all forest land should become public forest, although the area of public forest should be largely increased, alike by the nation, the states and local communities. It is not desirable, even if it were possible, that the policy be established of making any and all forest land public forest. What is needed rather is that the practice of forestry be introduced and extended over both publicly and privately owned forests. This is the road by which we may escape from our present unsatisfactory condition, the road that leads to an assured, ample and permanent timber supply for our nation.

The Small Paper Mill's Maintenance and Repair Department

By H. M. GRASSELT

IT SEEMS that many mills with an otherwise well-co-ordinate plant organization neglect to attach appropriate importance to the repair shop. The peculiar character of maintenance and repair work, influenced to a great extent by break-downs and accidents, appears to be so entirely out of the flow of other operations as to render planning in advance and adopting of a definite routine unfeasible.

However, a careful analysis of the problem will show that maintenance and repair work can be systematized to a point of practicability. A great number of the operations that form part of the repair shop work can be planned ahead and thus economically affect production and stop many leaks.

As indicated, this article will primarily deal with the problems confronting small mills without store departments, storekeepers or plant clerks and where, perhaps, the installation of an extensive system would not procure commensurate results.

Planning and Doing the Work

The foreman of the department—he will be called "boss millwright" throughout this article for uniformity's sake—as a rule, is a man promoted from the ranks who has acquired his sound knowledge of machines and equipment in his line through years of hard work. In a small mill, he will have but a very limited number of millwrights and helpers under him, and it is just here where organization, planning ahead and efficient laying-out of work will add effectively to the elimination of waste and help to increase profits.

Team work and co-operation with other departments is an all important factor in efficacious maintenance and repair work. Foremen of the various departments can greatly assist the boss millwright by bringing to his attention all irregularities on machines and equipment in their respective departments and in this way insure prompt action and avoidance of break-downs and accidents.

Since the boss millwright is held responsible for keeping the mill continuously in working condition, he should introduce systematic periodical inspections with the view of preventing break-downs and making improvements. Operatives should be educated to immediately report irregularities on their machines, but it is good policy not to entirely depend on them for this information.

Systematic maintenance of buildings and equipment is essential and absolutely necessary in order to obtain maximum results and safeguard the property. Weak or worn-out parts of machinery are to be mended or replaced at once, and spare parts for all important machines, whose break-downs would mean cessation of operations, should, therefore, be kept available whenever possible. Break-downs must be attended to at once when they occur, and it is on such occasions where a well-organized and trained repair gang will demonstrate its effectiveness and

capacity as an economical actor within the organization.

Periodical inspection systems depend on the character of machines and equipment and the wear and tear they are put up to. The boss millwright should keep an index card for each machine, which should contain instructions and definite questions that have to be answered in the course of the inspection. After completion of inspection and making of repairs that were found necessary, a record of the work should be entered and the card filed away in a tickler for the next inspection.

Shut-downs caused by low water, lack of orders, etc., afford good opportunities of giving machines and equipment thorough inspection and repairs. Sundays, as a rule, are very busy days for the repair gang. Work to be done on these days should be scheduled ahead and preparations made in advance, so that Sunday work with its double-time wages (as paid in many sections of the country) may be reduced to a minimum. Materials and supplies must always be ordered in time to have them available when the work begins. Waiting and going back and forth for tools or materials cause many small leaks, which, in the course of a year, run up into a considerable loss.

Machines would refuse to run if they were not oiled in regular intervals and lack of proper lubrication has caused a good many serious break-downs and accidents. Hence, the boss millwright should delegate one of his men to do lubricating and greasing with the precision of clock work.

Plant and machines must be kept clean; refuse, oily wipers and other rubbish should be collected and kept in fireproof receptacles until they are disposed of. Idle machines should be slushed with grease or some special compound to keep them from rusting. Janitor and watchmen have to work under the boss millwright's supervision, so that he may closely check up their work and remedy irregularities, especially in regard to watching. Worn-out machines or pieces of equipment should be removed to a place where they are not a detriment to plant activities.

Fire Inspection

Weekly fire inspection is another duty for one member of the repair shop. To insure methodical work, mills should evolve a simple form with questions covering the subjects to be weekly inspected. The work has to include an inspection of all inside and outside valves as to their being in working order and wide open. Dry systems (air valves) have to be tested for water column and air pressure. Steam pumps and rotary pumps should be looked after once in a week as well as the valves in steam connections from boilers to pumps. Furthermore, pumps must be given a thorough test with a rated number of hose streams at least twice a year. Fire-doors are to be inspected whether they close easily and whether automatic doors close when weight is released. Hydrants and hydrant houses and the standard equipment of the latter require weekly inspection. Hydrants are to be kept easily accessible and should be given a thorough test twice a year. It is also up to the inspector to see to it that mill yards and the mill itself are kept free from combustible material, that shafting and bearings are well cared for and clothes closets and toilets kept clean. Recommendations as to repairs and improvements made by him ought to be given immediate careful attention.

Salvage

The repair shop has to take care of salvage. It is indeed very poor economy to throw all waste metals upon a common heap, when they realize far better prices if kept separate according to their value.

Tools and Repair Materials

To enable the men to effectively execute their work necessitates providing them with standard tools adapted to the requirements of the plant. Tools must be kept in perfect condition at any time to maintain their full usefulness. Aside from impairing the workman's efficiency, defective hand tools cause surprisingly many minor accidents.

Tools, especially small ones, are frequently lost by being left where used, or carelessly scattered throughout the plan, and thereby continually create expenses that could be avoided by the introduction of a definite method of checking. In a mill without centralized tool control, the boss millwright should adopt a suitable, plain system of keeping track of tools and of making possible an adequate check on them. A section of the repair shop may be partitioned off for a storeroom for tools, repair materials and supplies. Racks and bins in appropriate sizes can be provided at a nominal cost. Tags with the name and a brief description of the tools or materials should be fastened thereto in order to enable them to be easily located when wanted.

A simple method of keeping track of and checking up tools is to number them and issue brass checks bearing the corresponding number and that of the repair man. Racks and bins should be provided with a hook on which the employee hangs the check that bears the corresponding number of the tool which he takes out. Upon return of the latter, the employee removes his check.

Of course there exist other more elaborate systems of tool control which involve considerable work and expense and would mean only an additional burden to the small plant without bringing proportionate returns. Nevertheless, economy demands the adoption of some definite method of tool control with the view of keeping a close check-up on tools and consequential elimination of confusion, waste of time and loss of money.

Repairmen should be provided with a tool box which may be easily carried to the place of activity

and containing a standard set of tools. Tools of certain types and pattern, provided expressly for individual machines or equipment of special make, must be always kept within easy reach at the place where they will be needed.

Last, but not least, the boss millwright has to take care of safety devices; that is, he has to see that machines and equipment are properly safeguarded, that safety devices are correctly attached and kept in their place. He personally should take steps to have recommendations, made and approved by the safety inspector or committee, carried out as soon as possible whenever the work pertaining thereto has to be done by his department.

So much for the practical end of maintenance and repair work. An article on the subject, however, would be incomplete and lacking the spirit of to-day, if it failed to at least outline some sort of an "efficiency system," whereby the practical work may be recorded and statistics for cost work and production control obtained. There is a wide gulf between red tape and a plain, but concise system of records and statistics. Today, systems are made to fit the plant and not vice versa. The practical man today realizes that records are tools to the management that wants to keep abreast with industrial progress and successfully meet ever increasing competition. Not only that, he also knows that records and statistics furnish him with a history of past performances and basic fundamentals, which will aid him in his work.

Machine and Equipment Records

The management should supply the boss millwright with a plant ledger, or better, with individual record cards containing a complete description of every machine and equipment, its manufacturer and installation. The first side of the card gives this information, while the reverse side is ruled for the entry of repairs and improvements. It would, of course, be impracticable to enter every minor repair, such as putting in a new screw, etc. Only repairs representing real improvements and actually extending the life of the asset are to be entered.

These records are similar to the plant ledger which is kept in the office, except that they do not show original purchase prices, depreciation charges and present values. The boss millwright will understand that depreciation charges differ according to character and use of a machine and that he is in a position to prolong life and usefulness of this property through expert care and maintenance.

In order to properly apportion repair and maintenance charges to the various buildings, machines and equipment, a definite procedure should be adopted to attain the end in view. Expenditures for repairs and maintenance, namely repair materials and supplies and labor, are part of the cost of production, and their correct distribution is quite necessary in order to arrive at accurate departmental rates for cost work. Many small plants simply charge supplies, repair materials and labor to Repair and Maintenance Account and allocate the burden in appropriate shares to individual buildings and departments.

A plain, but effective procedure of obtaining correct distribution data of maintenance and repair labor costs is to make up an itemized list of "Standing Jobs," to which all minor maintenance and repair work, that occurs in more or less regular intervals, is charged. This list of standing jobs is made up of (1) Minor Repairs on Buildings, (2) Minor Repairs on Rag Cutters, (3) Minor Repairs on Washers, (4) Minor Repairs on Beaters, and so forth until each ir dividual piece of machinery, etc., is covered by a definite standing job number. The boss millwright will use the respective standing job numbers in his Daily Labor Distribution Sheet.* While the paymaster will charge the total repair shop labor in the payroll to Repair Department or Repair and Maintenance account, he will also with the aid of the daily distribution sheets prepare a weekly analysis of job order labor for the cost accountant.

This method requires that the men are supplied with job tickets, on which the time spent on each job is registered, either in pencil or by mechanical time-recorders. The boss millwright will then take his figures for the daily labor distribution sheet from those job tickets. This procedure does not entail much extra work, as there are but a few men in the repair department of a small plant, and the boss millwright is here always in close touch with them and can easily check up their activities.

Repairs and actual improvements, which constitute an addition to the value of the respective asset, are, for obvious reasons, not included in the list of standing jobs. These transactions are covered by a separate Job Order, which is issued and approved by the superintendent or manager. Three copies of the order are issued, the first two copies on light

Job No..... Date.....

Subject:.....

Description of Work:

Estimated Cost: Date started.....

Charge to Account No..... Date finished.....

Approved.....

Fig. 1—8½"x5"

weight paper, as illustrated by Fig. 1, with blank reverse side; the third copy should be a regular index card with the reverse side ruled for entries of materials and labor costs. (See Fig. 2.) Copy No. 1 is to be given the superintendent, No. 2 to the boss millwright, and No. 3 retained in the office.

*See August issue The Paper Industry, "Wages, Timekeeping and Payroll."

The cost of materials and supplies used on that particular job may be entered from the vendor's invoices, while the cost of labor is taken from the weekly analysis of Job Order Labor. At the completion of the job, the total cost is charged to the proper account and the index card filed away. Thus a complete and comprehensive record of every improvement on buildings and equipment is at once available whenever a question arises. (They may serve effectively in questions arising on depreciation charges in federal tax returns.)

Date	Material	Cost		Date	Labor	Cost	

Fig. 2—Index Card—8½"x5"
(Reverse Side of Job Order Copy No. 3)

Analysis of Repair Materials
Month of.....192...

	Cost			Cost
Buildings		Job Orders		
Rag Room		No.		
Rag Cutter		No.		
Bleach Boiler		No.		
Washers		Etc.		
Beaters		Etc.		
Paper Mach. 1				
Paper Mach. 2				
Etc.				
Etc.				

Fig. 3—8½"x11"

General supplies and repair materials, bought expressly for such job order, but not entirely used up, may be transferred and charged to the Repair Materials account and the job credited accordingly.

The purchasing department should mention those job numbers on every requisition for materials, and insist that the shipper mark the goods in accordance therewith for identification by the receiving clerk and boss millwright.

General supplies and repair materials used for the aforesaid separate jobs and for standing job orders, if taken from stores, should be covered by a "requisition on stores" and at the end of each cost period analyzed.

Materials used for standing job orders are charged to their respective department and those used for separate jobs listed accordingly under the job order numbers, and the total for each number entered on the index card (Fig. 2).

A study of the maintenance and repair work problem and the adoption of a definite policy governing it will produce concrete results, reflected in greater personal efficiency on the part of the individual members of the department, improved output, increased care of property and reduced waste and spoilage.

"Safety First," from a Psychological Point of View

By JAS. H. RIELLY
Locomotive Engineer, Chicago, Milwaukee & St. Paul

I SAW in some of the newspapers that the public schools were including "Safety First" in their curriculum. As most of the grown ups cannot attend school there will have to be some provision made for them. I figure that ninety per cent of accidents occur while people are in a subconscious state of mind. Therefore "Safety First" should be taught and kept before the public at all times so that it will be an ever active influence in this subconscious state.

The fear of danger in dangerous places should be kept so thoroughly alive at all times that guarding against it will become a matter of subconscious habit. The wise man forms the habit of lacing his shoes or buttoning his collar correctly by reducing the process to a regular routine so that he often finds that he has performed these necessary duties very satisfactorily, even when his mind was preoccupied with other thoughts. He has learned to make habit his useful servant.

So also with "Safety First." The idea should be fixed in habit so that even when people are thinking of other things they are subconsciously heeding the admonition to "Stop, Look and Listen!"

Herein is the value of the slogan, namely, in the education of the subconscious mind. It is on this account that such slogans as those of "Safety First," "Stop, Look and Listen," "Cross Crossings Cautiously," "Look Out for the Cars," etc., should be placed on all railroad stationery and other literature for general distribution to the public.

THE MAN WHO WINS

The man who wins is the average man
Not built on any particular plan,
Not blessed with any particular luck,
Just steady and earnest and full of pluck.
For the man who wins is the man who works,
Who neither labor, nor trouble shirks
Who uses his hands, his head, his eyes
The man who wins is the man who tries.

—The Broke Hustler.

Power Plant Management

Efficient Combustion Practice—Effecting Savings Through Control of CO_2

By ROBERT JUNE, M. E.

This is the third in a new series of articles by Robert June, the well known authority on Power Plant Management. The articles are written from the point of view of the managing executive and deal with the dollars and cents end of Power Plant Operation and Maintenance. Succeeding articles deal with such live topics as Safe and Efficient Boiler Operation, Stoker Operation and Maintenance, What Management Should Know About Coal and Ash Handling Equipment, Steam Piping, Efficient Turbine Operation, etc. The series is timely and should prove of value to our readers.

FLUE gas analysis in and of itself will not improve boiler room efficiency, any more than taking the temperature of a fever victim will cure him of his ills. Flue gas analysis apparatus, like the clinical thermometer, is of value only as a basis for intelligent action.

What Flue Gas Analysis Will Enable You to Accomplish

The constant regular determination of flue gas analysis will enable you to accomplish the following results:

1. Improve methods of handling fire.
2. Improve draft regulation.
3. Detect air infiltration.
4. Indicate necessity, if any, to provide secondary air supply.
5. Indicate needed changes in design and construction of furnace.

In addition to the above, installation and regular use of flue gas analysis apparatus in your boiler room will increase the morale of the entire boiler room crew. Efficiency is infectious. Being stimulated to employ better firing methods, they will handle every part of their work in a better, more economical manner.

Taking up the various points mentioned above in order:

Improve Methods of Handling Fire

Thin fires through which holes quickly develop insure low CO_2. The fireman cannot always tell by inspection when his fires are too thin. He may be careless, and if there is no check on CO_2 no one may be any the wiser.

There is no such thing as a fixed adjustment in the operation of a boiler. Load conditions vary and the rate of combustion must follow suit or the steam pressure will drop. This calls for variations in the thickness of the fire, and these variations cannot be made anything like as correctly without CO_2 equipment as with it. With hand-fired boilers a continuous CO_2 record shows how often the fires were replenished, how long the fire doors were left open, when fires were cleaned, and how long it took to clean them. In stoker fired boilers equivalent changes are indicated.

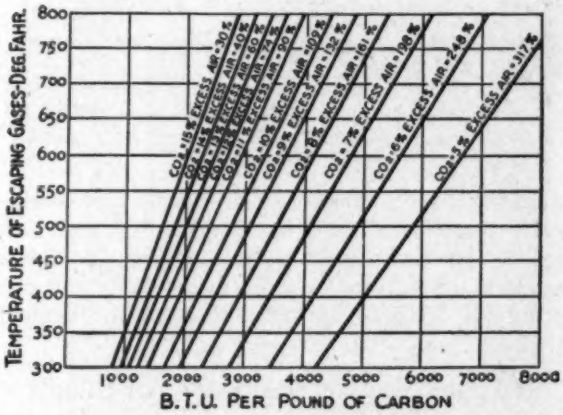


Fig. 1—Losses occurring with various percentages of CO_2

Improve Draft Regulation

Unnecessarily high drafts decrease the percentage of CO_2. On a test of a Manning boiler burning No. 1 Buckwheat, a fairly uniform relation between the boiler draft and the amount of CO_2 was indicated. With a draft of 0.20 inch a CO_2 content of 8 per cent was found. Reducing the draft to 0.18 increased the CO_2 to 9 per cent. A further drop in draft to 0.15 inch produced a 10 per cent CO_2. Cutting the draft still further to 0.14 an 11 per cent CO_2 was established. With a draft of 0.12 inch the CO_2 content was increased to 12 per cent. Here the improvement ceased. A further drop in draft resulting in a decrease in CO_2, showing that for the particular load demand and the particular condition of the fuel bed during the test a draft of 0.12 inch was most economical.

With another fuel and under other conditions a different draft would be required. The economical draft can be more readily determined with the aid of CO_2 analysis apparatus than in any other manner.

Detect Air Infiltration

The presence of leaks permitting the infiltration of air into the setting through the brick work or doors can be detected readily by means of CO_2 ap-

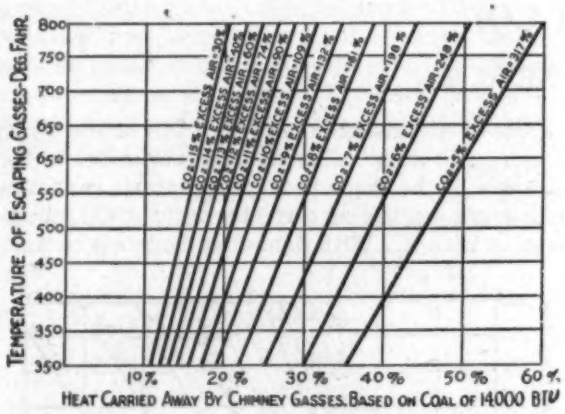


Fig. 2—Percentage of heat lost (coal 14,000 B.T.U.) with various CO_2 percentages

paratus. If the percentage of CO_2 is not increased by better handling of fires or by adjusting the draft, then it is time to examine the setting. A lighted candle passed slowly over the brick work and door joints will indicate air infiltration as the flame is sucked in.

Indicate Need of Secondary Air Supply

Each pound of fuel of a certain composition requires a certain fixed weight of air for complete combustion. In addition to this fixed amount an additional percentage of excess air must be provided so that despite faulty distribution of the air supply there will be a particle of oxygen available for each particle of carbon or other combustible to be consumed. Whether the amount of excess air is high or low determines boiler efficiency. As the amount of excess air is measured by the percentage of CO_2, we can determine by the use of CO_2 indicators whether we have an adequate supply of air, properly distributed.

Indicate Need to Change Furnace Design

Insufficient combustion space is another direct cause of low CO_2. If we have carefully checked over our firing methods, draft regulation, condition of our settings and air supply, and if we still find that we are getting low CO_2, it is time to examine furnace design and furnace volume. Hundreds of furnaces are reconstructed every year to the profit of the owners, as a result of the findings of CO_2 indicators.

Relation Between CO_2 and Losses in Dry Chimney Gases

The loss due to heat carried away by dry chimney gases for varying percentages of CO_2, and different temperatures of exit gases is shown in Fig. 1 and Fig. 2. Fig. 1 shows the actual loss in B.T.U. Fig. 2 shows the percentage loss of the total value of the fuel, based on a coal of 14,000 B.T.U. Table I. gives a rough approximation of the per cent loss up the chimney for the several major classes of fuel.

CO_2 Indicators and Recorders

A great many different types of apparatus have been developed for indicating and recording CO_2. In describing and illustrating a number of these, we do not impute any lack of merit to makes of apparatus not mentioned, or to those not illustrated or only described briefly.

The Orsat

The orsat, Fig. 3, is employed for volumetric analysis of a single sample. The principles employed in the equipment illustrated are used in practically all of the portable appliances on the market. A measured sample of gas having been drawn from the stack, is forced successively through pipettes containing solutions of caustic potash, pyrogallic acid, and cuprous chloride in hydrochloric acid, respectively, thus absorbing the carbon dioxide, the oxygen

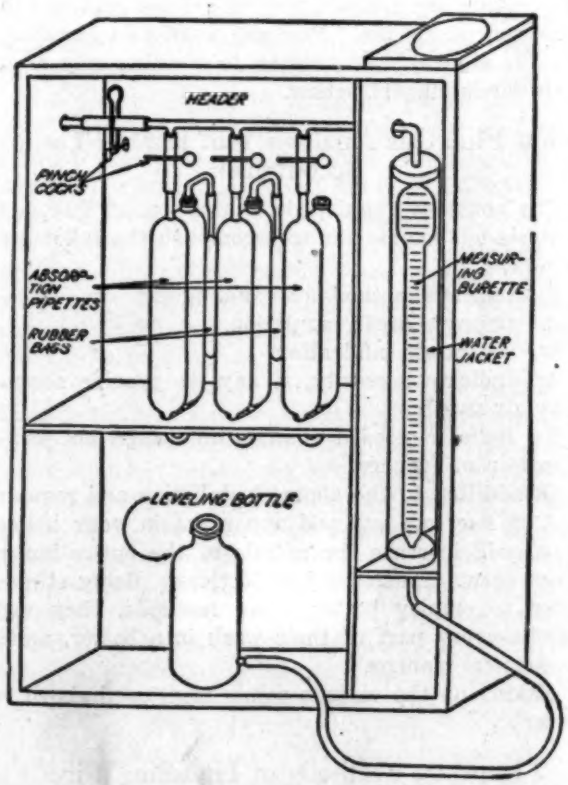


Fig. 3—The Orsat

and the carbon monoxide, the contraction of volume being measured in each case. The original orsat apparatus is bulky, fragile and slow, but it is accurate. Some recent modifications have considerably improved the apparatus. There is room for an orsat in every power plant for the following services:

1. To determine the maximum CO_2 which can be carried while still securing complete combustion.
2. To inspect settings for air infiltration.
3. To check up the continuous CO_2 recorders.

By itself the orsat is inadequate as a control for the firing operations of a boiler plant. It is decidedly better than nothing, however, and as it is not expensive it should be employed in every plant whether CO_2 recorders are installed or not.

Foxboro CO_2 Recorders

In the Foxboro recorder, Fig. 4, as in the orsat a solution of caustic is used for a re-agent. The motive power is obtained from a constant flow of water and the periodic operation of an automatic syphon, the amount of water required per day being approximately two barrels. There are only three moving parts—the clock movement for rotating the chart, the pen-actuating float, and the dotting mechanism.

The operation of this particular machine is as follows: The water flows through the coils into measuring vessel (3) and traps a definite volume of gas in bulb (5), forcing it over through tube (6) to absorption vessel (2), where it bubbles up through caustic solution (7), which almost instantly absorbs the CO_2 gas present. Above the caustic solution is a layer of oil, and above that is gas chamber (9). A float tube (10) terminates in a tube (11) which extends through the oil almost to the level of the caustic solution. Pressure in chamber (9) causes oil to flow through tube (11) into float tube (10) which encloses a float, to the upper end of which is fastened a pen (13). The distance the pen will rise depends upon the quantity of gas forced into the gas chamber by the rising water—the gas reaching the gas chamber being residue of the original sample after CO_2 is removed. The water rising in the water-

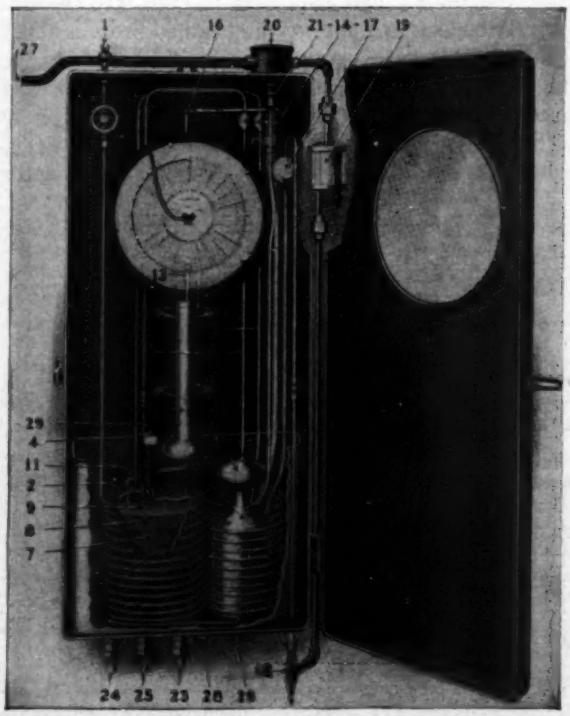


Fig. 4—Foxboro CO_2 Recorder

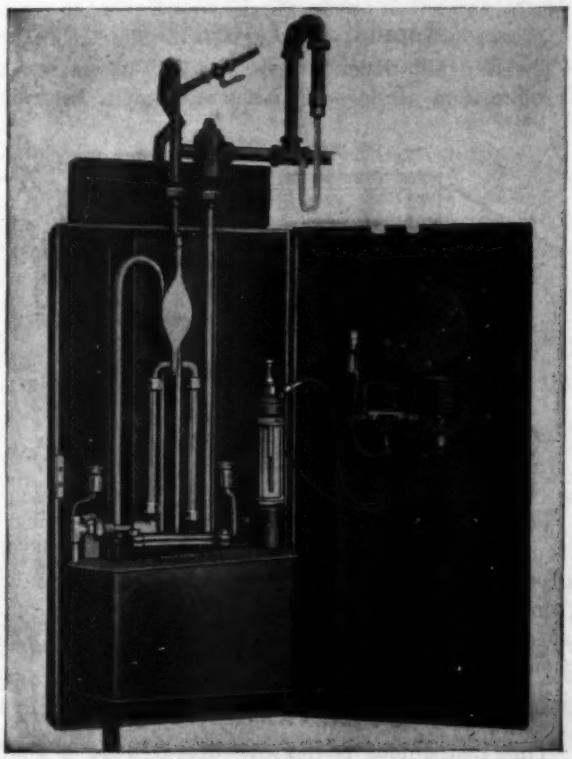


Fig. 5—Hays Model B CO_2 Recorder

float tube (14) raises a float which operates dotting mechanism (16), causing the pen to press against the chart.

The water now syphons out through (17), and, as the syphon takes water away faster than it is delivered, the float in (14) drops, releasing pen (13). As the water continues to syphon out, the pressure in the gas chamber decreases and eventually balances to atmospheric pressure through the exhaust pipe (22), the float in tube (10) dropping to normal position. Water passing through the syphon operates aspirator (18), creating suction through water seal (19), and draws flue gas through the chamber of filter (20). Part of this gas is drawn through the filter into measuring vessel (3) through intake pipe (21). When the syphon (17) breaks, the pressure of the gases in measuring vessel (3) balances, and the cycle is resumed by the rising water trapping the unit quantity of gas in bulb (5).

Uehling Apparatus

The principle involved in the operation of the Uehling CO_2 meter depends upon the change in pressure in a stream of gas flowing through two aper-

tures, caused by absorption of its CO_2 content. The apparatus consists of three principal parts, namely the CO_2 meter proper, the recorder for the engineer's office and the auxiliary boiler front indicator for the fireman. The CO_2 is extracted, in the CO_2 meter proper. The CO_2 meter, in turn, actuates the recorder and indicator.

Republic CO_2 Recorder

The Republic depends upon the flow of water for its operation. It is so constructed that a variance

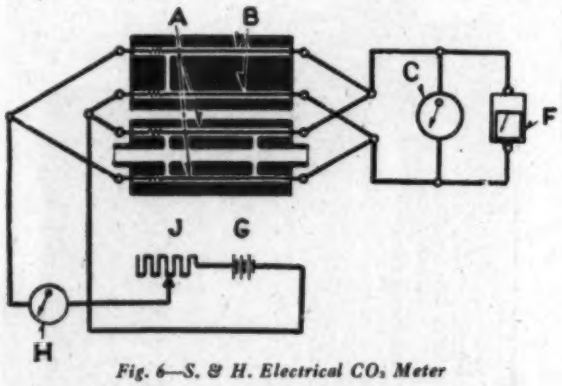


Fig. 6—S. & H. Electrical CO_2 Meter

from a minimum supply to a full open valve will not affect its proper functioning. The gas is drawn from the furnace to the instrument by means of a water jet and aspirator. It, like the Foxboro, is a chemical machine.

Precision CO_2 Recorder

This instrument is likewise operated by a small stream of water. Individual gas samples are taken, analyzed with the aid of chemicals and the results recorded. After one sample has been analyzed another is taken immediately and duly recorded.

Hays Automatic CO_2 Recorder

In the operation of the Hays CO_2 recorder, model B, Fig. 5, a continuous stream of gas is drawn rapidly from the last pass of the furnace and at regular intervals the machine takes a measured sample of this gas, causes the CO_2 to be absorbed by means of caustic potash (KOH) solution and the pen to move on the chart to a point representing the per cent by volume of CO_2 contained in it. Such variables as temperature and pressure of the gas sample, evaporation of water and changes in the specific gravity of the KOH solution are automatically controlled by the machine.

Water from the regular source furnishes the motive power for the Hays recorder; about one gallon is required for each operation. This flows into the aspirator A and thence into the overflow box B. The speed of operation (closeness of lines on the chart) is governed by the amount of water admitted to the recorder through the sliding sleev regulating valve C. The range of adjustment is from one to four minutes, but a cycle every two and three-fourths minutes is recommended.

Bachrach Electrical CO_2 Meter

The S. & H. CO_2 meter (Bachrach), Fig. 6, operates on a principle entirely different from that of the chemical CO_2 indicator; it makes use of the physical property of heat conduction of the gases. The arrangement of the meter is shown diagrammatically in the illustration. The "Tester" consists of two sets of blocks, one set containing chambers "A" and the other chambers "B." In the center of each chamber is a thin platinum wire always central, regardless of heat expansion. "A" are the measuring chambers through which the flue gas passes slowly; "B" are the comparison chambers, containing air at room temperature. The electrical system is arranged in a Wheatstone bridge circuit, of which the four branches are the four platinum wires in the two blocks. Across the mid points of the bridge is connected the sensitive indicating galvanometer C. If desired the recording galvanometer F, which may be placed at any reasonable distance from the measuring instrument, can also be connected into the circuit. The electrical energy is obtained from a small storage battery G through a variable resistance J, which is adjusted to give constant current through ammeter H.

The flue gases consist of carbon dioxide (CO_2), carbon monoxide (CO), oxygen, nitrogen, and water

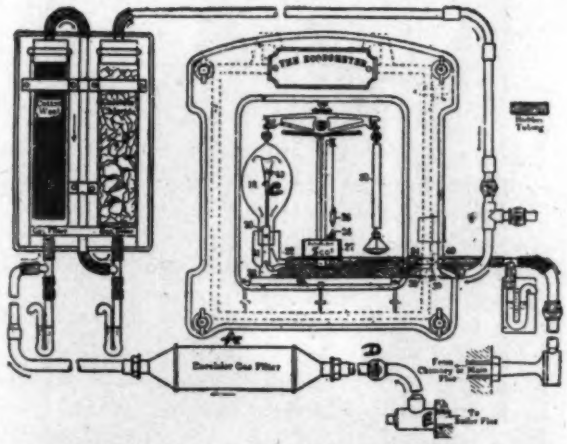


Fig. 7—The Arndt Gas Balance CO_2 Meter

vapor, with traces of other gases. Nitrogen, oxygen, carbon monoxide and air all have practically the same heat conductivity, but CO_2 has 40 per cent less conductivity, and water vapor a conductivity about 30 per cent greater than that of air. The air in the comparison chamber is kept free from water vapor by the presence of hydroscopic chemicals, and the flue gases having passed through a cooler which also acts as a dryer, contain a very small, but practically constant, quantity of water vapor, hence the

only variation occurring in the heat conductivity of the gases depends directly on the percentage of CO_2 in the flue gas.

As the electric current flows through the platinum wires, the heat which is generated in them is transmitted through the gases to the walls of the chambers. The gases in "A," containing CO_2, transmit the heat less readily than the air in "B"; and the wires in "A" become hotter than the wires in "B"; its resistance therefore increases, unbalancing the circuit and causing a deflection of the galvanometer, to an extent depending on the percentage of CO_2 present. The galvanometer is calibrated to read directly in per cent of CO_2.

TABLE I.

Heat loss with various percentages of CO_2 for different fuels.

Per Cent CO_2	Carbon	Anthracite Coal	Bituminous Coal	Fuel Oil
	Loss	Loss	Loss	Loss
3	67.2%	61.8%	58.1%	49.4%
4	50.5	47.1	44.6	38.9
5	40.7	38.3	36.5	32.6
6	34.0	32.3	31.1	28.4
7	29.3	28.1	27.2	25.3
8	25.8	24.9	24.3	23.1
9	22.9	22.4	22.1	21.4
10	20.7	20.5	20.3	19.9
11	18.9	18.9	18.8	18.8
12	17.4	17.5	17.6	17.9
13	16.1	16.4	16.5	17.1
14	15.0	15.4	15.6	16.4
15	14.1	14.6	14.9	15.7
15.7				15.3
16	13.3	13.9	14.2	
17	12.6	13.2	13.6	
18	11.9	12.6	13.1	
18.6			12.8	
19	11.3	12.1		
19.5		11.8		
20	10.8			
21	10.3			

Arndt Gas-Balance

This instrument, for the description of which we are indebted to Mr. John B. C. Kershaw, is illustrated in Fig. 7. The action of the Arndt apparatus is based upon direct measurement of the weight of the gases, CO_2 being heavier than air. In the absence of moisture, and at a fixed standard of temperature, the variations in density serve as an index of the CO_2 contents of the gases. The method of operation of the instrument is as follows: the gases are drawn continually from the flue at E by means of the steam-jet D. They pass first through the filter A, then through the drying tubes B, and finally through the weighing-bulb C. The scale of the balance is graduated, so that the percentage of CO_2 can be read off directly. With a recording attachment of the usual type, a permanent record of the variations is obtained.

The Krell CO_2 Recorder

This instrument is closely allied to the Arndt Gas-Balance. A very delicate differential pressure-gauge is employed to determine the difference in weight, of measured volumes of the flue-gas and air; and it is attached to two columns which are of equal height, the one containing air and the other the sample of flue-gas. A slightly inclined glass tube, which is filled with colored alcohol, is employed to record the pressure gauge reading. The height of this thread of colored alcohol varies with the pressure, and by means of a scale, which is marked in the percentages of CO_2, corresponding to certain pressures, the amount of this constituent of the flue-gas can be read off.

The Haber-Loewe Refractometer

This instrument depends for its action upon measurements of the "refractive index" of the mixed gases. The method is thus an optical one, and resembles the optical methods for determining temperatures. The refractometer consists of the following three parts: a prism, a telescope and a microscope. The prism, made of varnished metal, is provided with windows on opposite sides for the incident and reflected rays of light to enter and escape—and the gas to be tested flows through it, while the gas used for comparison flows through the casing. The observer sees in the field of vision when using this instrument, a scale which is partly illuminated and partly in darkness. The boundary of the dark zone will coincide with zero on the scale in pure air. In air containing 9 per cent CO_2, this boundary will coincide with 1.0 on the scale; and the line of demarcation between the light and dark zones will be still further shifted, for higher percentages of CO_2. The instrument can be graduated, however, to yield the percentages of CO_2, or some other gas, directly by observation.

Checking Flue Gas Analyses

The heat balance itself is always a good check on the accuracy of the results of a boiler test. The radiation and unaccounted for losses are always determined by difference. If this item is larger or smaller than the conditions would warrant, judging from experience, then an error has been made either in the observed or calculated data. This may be due to the gas sampling tube not being located properly or to some error in the analysis, either from a faulty instrument or technique.

In order to check out on the results of an actual test, Prof. Thomas G. Estep worked out the following concrete example based on data taken from the report of a boiler test.

Ultimate Analysis of Dry Coal

Carbon ..... 77.00 per cent by weight
Hydrogen ..... 5.00 per cent by weight
Oxygen ..... 8.00 per cent by weight
Ash ..... 10.00 per cent by weight

Dry Flue Gas Analysis

Carbon dioxide	12.00 per cent by volume
Oxygen	4.50 per cent by volume
Carbon monoxide	1.50 per cent by volume
Nitrogen	82.00 per cent by volume

The weight of the dry products of combustion per pound of dry coal is given by the equation,

$$\text{Weight dry products} = \frac{4\ CO_2\ O_2\ 700}{3(CO_2\ CO)} \times C$$

$$\text{Weight of dry products} = \frac{4 \times 12\ 4.5\ 700}{3(12\ 1.5)} \times .77 =$$

14.31 pounds per pound of coal.

In order to find the theoretical weight of air required to burn one pound of fuel, it will be necessary to find the weight of carbon that is burned to carbon dioxide and to carbon monoxide. The assumed flue gas analysis can be converted to per cent by weight with the following result:

Carbon dioxide	17.51 per cent by weight
Oxygen	4.78 per cent by weight
Carbon monoxide	1.40 per cent by weight
Nitrogen	76.31 per cent by weight

Of the total weight of the dry products of combustion of one pound of dry coal, 1.4 per cent is carbon monoxide. Therefore, the weight of carbon monoxide per pound of fuel is $14.31 \times .014 = 0.2$ pound. Since carbon is $12 \div 28$ of the weight of carbon monoxide, the weight of carbon burned to carbon monoxide is $0.2 \times \frac{12}{28} = .086$ pound per pound of fuel. The carbon burned to carbon dioxide is $.77 - .086 = .684$ pound per pound of fuel. The weight of air required theoretically to burn one pound of the coal under the assumed conditions is as follows: $\text{Weight of air} = 11.580\ \ 34.8(H - \frac{0}{8})$

$5.780 = 11.58 \times .684\ 34.8\ (.05 - \frac{.08}{8})\ 5.78 \times .086 =$

9.81 pounds per pound of coal.

The air actually used under the assumed conditions is the weight of the dry products of combustion minus the weight of the carbon in the fuel plus the weight of the oxygen supplied to burn the hydrogen. Hence,

$$\text{Actual weight of air} = 14.31 - .77\ \ 8(.05 - \frac{.08}{8})$$

$= 13.86$ pounds per pound of coal.

The apparent excess air is $13.86 - 9.81 = 4.05$ pounds.

Now, if the assumed flue gas analysis is correct for the given coal analysis, it should check with the flue gas analysis calculated from the above excess air. To calculate this flue gas analysis, per cent by volume, the following results:

Volume of		Cubic Feet
Carbon dioxide	$= .684 \times 3.67 \times 8.15 =$	20.45
Carbon monoxide	$= .086 \times 2.33 \times 12.80 =$	2.57
Oxygen	$= 4.05 \times .23 \times 11.21 =$	10.46
Nitrogen	$= 13.86 \times .77 \times 12.77 =$	136.00
		169.48

$$\text{Carbon dioxide} = \frac{20.45}{169.48} = 12.08 \text{ per cent by volume.}$$

$$\text{Oxygen} = \frac{10.47}{169.48} = 6.17 \text{ per cent by volume.}$$

$$\text{Carbon monoxide} = \frac{2.57}{169.48} = 1.52 \text{ per cent by volume.}$$

$$\text{Nitrogen} = \frac{136.00}{169.48} = 80.23 \text{ per cent by volume.}$$

Since this analysis does not agree with the assumed analysis, it is evident that the latter is not correct, or at least it cannot be used with the given coal analysis.

Paper Piping

A NEW use of paper on a commercial scale for the manufacture of water piping and the like by an improved process, is paper piping. This improved success has been proposed by a French inventor, M. Dalery.

The paper or light pasteboard is wound directly upon the shaft of a machine, using a tank containing an adhesive substance. The last layers are impregnated with tar, then the pipe is given a covering of bitumen as for gas and water pipes.

More minute details contained in an article published recently in the Scientific American are in part:

"Suitable measures are taken to produce a large diameter portion at the end of each pipe section, into which is fitted the smaller end of the succeeding section, then the joint is made tight by a tar treatment and by winding the joint with a strip of 3 inch tarred fabric.

"Tests were made with the new piping in order to set forth the three principal characteristics which are required, tightness, strength and interior pressure and good preservation. As concerns the tightness of the piping, several sections were mounted in a vertical position and the bottom was well stopped up, a water pipe being placed in the pipe and allowed to stand for twenty-one days. At the end of this time there was no trace of leakage, so that this test appears conclusive.

"On the whole, it appears very probable that piping made of paper can be manufactured as a practical article, at least for numerous purposes."

Common Sense and Cost Systems

By THOMAS J. BURKE, C. A.
Secretary-Treasurer, Cost Association of the Paper Industry

AT THE risk of being accused of reiteration, I want to urge again upon executives the importance of spending some of the time which they set aside for promotional work, in an examination of the possibility of bringing about improvements in the manufacturing efficiency and general work of their mills through developing their cost departments.

I have selected the above title, "Common Sense and Cost Systems" for this short article because I desire very strongly to emphasize the fact that the Cost Association has consistently followed a policy of simplicity in everything it has undertaken, as regards costs. We have endeavored to find the simplest and best way of doing things. The only method to find the simplest and best way is to examine all the different methods in use, but we cannot do this unless it is made possible for us to do so. In other words, we are asking very sincerely that executives will permit and cost accountants will agree, to supply us with information regarding what they are doing in cost work, and what they would like to do. You have doubtless heard it said on numerous occasions that executives themselves are not interested in costs. What they want are results which will show in their dollars and cents column. They fight shy of even discussing their cost departments, because so much has been written regarding cost systems which has made it appear that a cost system is a conglomeration of forms and reports which causes a lot of work and worry, without giving adequate results.

But after all, what is a cost system? Nothing more than applied common sense. Take your mill, you have bought that mill at a big outlay; you have to pay taxes and insurance and repairs on it, and in addition every year there is a certain amount of depreciation, to meet which a sum should be set aside periodically, so that as the mill falls into decay, there will be an adequate sum on hand to replace it. Now then, you have bought that mill in order to have a place to manufacture your pulp or paper. The sensible thing to do is to make a charge against that pulp or paper for the use of that mill, and this charge must of course be based on the cost of the mill to you, both the cost of producing and the general upkeep as outlined above. Is not the most sensible way of doing this to allocate these costs on the basis of the space provided in the mill? Certain operations have to be carried on in your mill, and each of these operations requires space in the mill. Why not, then, charge into the cost of these operations your cost in providing the space for them to be carried on?

Another point to be considered, however, is that you may not be using that space all the time. The mill may be shut down. Is it not then a sensible thing to take this into consideration and to make up your mind what is the normal running time of your mill, and base your charges for the use of the space provided on this normal running time, so that when the mill is shut down, owing to lack of orders, you may quite fairly determine what is the cost to you of shutting the mill down during that time? Why attempt to charge that cost into your products? It has often been pointed out in this connection, that if a shirt factory made 10,000 shirts a year and the overhead was $10,000, the overhead cost to be added would be $1.00 a shirt, but that if that factory only made two shirts during the year, the overhead cost per shirt, if no allowance be made for time shut down, would be $5,000, which, of course, would be absurd. But, that is practically what many pulp and paper mill executives are doing today. They are not taking into consideration, in estimating their costs, the fact that sometimes their mills are shut down or are running below their normal capacity because of lack of orders. This is a most important point which should be seriously considered, and some attempt made to get correct costs.

Most of the remarks made above regarding the mill, apply also to the machinery and equipment purchased for the mill. They, too, depreciate and have to be repaired. But in allocating the cost against the products made on these machines, we cannot do so on the basis of the space taken up by the machines; that would not be a sensible procedure. What we have to do, is to determine the normal producing capacity of these machines, also their normal running time. Against this normal running time, we have to list the cost to us of putting that machine where it is and making it do its work. Now, what is the most sensible way of allocating the cost? Is it not the time basis way? If we then determine what it costs to run the machine for an hour by totalling our costs and dividing them by the normal running time of the machine, we have a very simple way of finding out what our costs are on each operation, by adding the productive labor used in connection with that machine, the raw material cost, both of which are of course always easily obtained, and the cost of the space taken up by the machine.

Again we have to take into consideration the time shut down for causes beyond the control of the production department, such as lack of orders. Since, however, the hourly cost of running the machine has been determined, it becomes a comparatively simple

matter to ascertain the cost of these shut downs. These things, of course, are common knowledge. They are only mentioned here because of the apparent necessity of insisting upon the fact, that although it is necessary to compile a great number of figures in arranging a good cost system, for which cost accountants are often criticized, yet it should be remembered that these figures merely represent the carrying out of quite common place common sense ideas.

We all know that in this country, and probably the world generally, the quality of patience for which our forefathers were noted has become rare. Most of us are impatient to get a thing done quickly. We want results at once, and any short cuts we can take are taken, sometimes without a sufficiently careful examination as to whether these short cuts will lead us where we want to go. In other words, while we want things done in a common sense, practical way, we are not always willing to undertake the necessary drudgery in connection with this way.

The layout of a good cost system, even in a common sense practical way, is very hard work; it requires not only skill but diplomacy, and a very conscientious worker. It took the Federal Tax Acts to awaken the public to the fact that there was a great deal more in accountancy than they had ever imagined. For too many years, bookkeepers have been laughed at for doing things considered unnecessary. The expression generally used being "too theoretical."

The Federal Tax Acts have, however, somewhat changed that. The public realizes a good deal better than it did the necessity for the use of proper accounting methods in its business.

The Government has called for information which can only be given satisfactorily by means of a properly kept set of books, and I have repeatedly heard it said, that at least to this extent the Federal Tax Acts have benefited American business.

What Failures Teach

Now as to costs, cannot the pulp and paper industry take a lesson from the many mills that have gone into bankruptcy in the past? No doubt many causes have contributed to the downfall of these mills, but nobody can deny the fact that many of them failed for amounts which indicated very, very clearly the fact that the mills had been operating for some time past, prior to their final break, on a basis which made it impossible for them to even "break even." In other words, it has often been made clear in the investigations made by the referees, that the men operating these mills were not in possession of the necessary facts regarding the operating costs of the mills, or they never could have possibly permitted production to continue on the basis on which it had continued. The common sense thing would be, it appears, to take a lesson from these numerous bankruptcies, especially at a time when we are told, and personally I am inclined to believe it, that competition must become more severe, and definitely decide the facts about costs. Decide that we want to know how our mill cost is being taken care of; how our machinery and equipment cost is being taken care of. What is being done about executives' salaries? Are they being considered in the cost? Has any attempt been made to allocate selling expenses? Questions like these and many others are the ones which it seems to me executives should insist be answered to their satisfaction. But that is only one phase of the facts to be derived from a common sense cost system, namely, that we get facts as to our operating costs, because once we are assured that these facts are correct, we are in a position to make further investigations, in an effort to determine whether we can cut down these costs in any particular.

We may find that some machine on which we have been priding ourselves as being one which has rendered extremely good service for a long period of years, is in fact being operated at a very high cost, and that it would very well pay us to replace it with a more modern machine.

Steam Costs

No article on Common Sense Costs for Paper Mills is complete, however, without some reference to steam. This is indeed a subject which requires a book to itself. The Cost Association some months ago sent out questionnaires on Steam Costs. They were very carefully made up by a competent engineer. The number returned to date has been most disappointing, evidently due to the fact, that the filling in of these questionnaires would involve a lot of work in the cost department.

Help the Cost Association

In this connection, I want to make a very strong appeal to cost men throughout the industry, to give a little of their time weekly to the development of cost work generally. Here is the Cost Association, financed by the Pulp and Paper Manufacturers, operating not only for the benefit of those manufacturers and others who do not contribute, but also operating in the interests of the cost men themselves.

As secretary-treasurer of this association, I am only too anxious to be of service to cost men in the industry. I am glad at any time to receive inquiries or suggestions from them, whether the mills to which they are attached are members of the association or not. It is our belief that if the association proves its worth, the mill will later on become a member, and in many cases in the past this belief has been justified. Therefore, I very strongly appeal to cost men to remember Theodore Roosevelt's statement,

to the effect, that "every man owes a certain amount of his time to the up-building of the profession or industry to which he belongs."

The filling in of the Steam Cost Questionnaire may be impossible for some mills. It may involve very hard work on others, but just this fact, proves the necessity for filling in the questionnaire. The very fact that the information necessary is not available, proves that the mills making these statements do not themselves know really what their steam is costing them, nor how the steam is being used. They may have very up-to-date mills, but if they are not in a position to state definitely the cost of running their steam plant, and the use to which the steam made in that plant is put; then I say, they are very urgently in need of obtaining the information which the Steam Cost Questionnaire we sent out would develop.

There are many other points which might be discussed, but enough has been said to indicate clearly enough that even common sense cost systems involve careful thought and lots of hard work.

Electric Steam Boilers

By P. BERGEON

Translated from La Papeterie xlv, 276-282 (March 25, 1923) by A. Papineau-Couture.

ELECTRIC steam boilers, which were almost unknown before the war, are coming into more general use every day. From the necessarily incomplete data which we have collected, we judge that there are at present throughout the world several hundred electric steam boilers which can absorb over 500,000 horsepower.

As far as we know, it was the Italian engineer Revel who was the first to construct a commercially successful electric steam generator; for long before the war, as early as 1902, he made several large installations, chief among which was that at the Bussi plant of the Societa Italiana di Elettro Chimica where in 1907 he installed large units working directly at 6,000 volts. In 1920 we had occasion to see this installation, about which much had been written in the technical journals. There were at the time seven boilers, of 800 horsepower each, which were working quite satisfactorily. They used the night power of the Pescara central station which supplies power to the city of Naples.

Since the war, owing to the high price of coal, the use of electric boilers has increased fairly rapidly, especially in Italy, Switzerland, Norway and Sweden. In France they are coming into use in the region of the Alps. A battery of two large boilers each of which can normally absorb 5,000 horsepower, and up to 6,000 at peak load, as three-phase current at 6,500 volts, has been working intermittently since the beginning of 1920 at the Brignoud paper mill in Dauphiné. It has already absorbed over 500,000,000 kilowatt hours generated during the high water period and has thus economized at least 7,000 tons of coal. To our knowledge they are the largest in the world.

Boilers can now be constructed for relatively high voltages. There are several boilers in Switzerland taking current directly at 15,000 volts, and 20,000 volts could very well be used. The boilers can also be built in large units and for high pressures. It can therefore be said that electric boilers have proven that they are practical and are capable of great usefulness.

Types of Electric Boilers

There are two classes of electric boilers:

1—Resistance type, in which the heat is generated by passing the current through a suitable resistance;

2—Induction boilers in which the water is heated by means of Foucault currents and hysteresis in a mass of iron.

Resistance boilers are by far the most common. Induction boilers are very much more expensive, except possibly when the voltage is very high and the power consumed low. Moreover, with induction boilers there is a considerable current lag. With these boilers cosδ lies between 0.5 and 0.7, while with resistance boilers it is practically equal to unity, which is a very big advantage.

In resistance boilers, if R is the heating resistance in ohms and U the potential difference in volts at the terminals, the power P absorbed is given in kilowatts by the formula

$$P = \frac{U^2}{1{,}000R.}$$

In order to change the production of steam, that is, the power absorbed, either the voltage or the resistance must be changed. As a rule it is the resistance that is changed, as the boilers are meant to operate under constant voltage.

It is seen from the above formula that if the voltage of the circuit is not constant the power absorbed by the boiler can vary considerably, as it is proportional to the square of the voltage. This is an advantage for the producer of electric power, as the boiler increases or decreases the total load on the circuit as the voltage rises or falls, and it consequently diminishes to a certain extent the amount of variation in voltage. By improving the cosδ of the circuit and de-

creasing sudden variations in the voltage, the electric boiler makes for a more efficient operation of the circuit. This has been observed to be the case in practice, especially at Brignoud, where the electric boilers are fed from a station which also furnishes power to numerous electric motors and large capacity electric furnaces.

If the boiler is not working in conjunction with coal-fired boilers and if it does not contain a sufficiently large amount of water, variations in the electric tension may become troublesome and prevent an even and regular generation of steam. It is then necessary to use some automatic regulator, which, in spite of its relatively slow action, nevertheless does not prevent the beneficial action of the boiler on sudden changes in the tension of the circuit.

Resistance boilers can also be divided into two groups:

1—Those in which the heating resistance is constituted by the water in the boiler, to which the current is brought by means of electrodes;

2—Those in which some material other than the water is used as resistance (metal or graphite).

The first are generally called electrode boilers, the term resistance boiler being usually applied to the second type. In the latter the resistance is generally made of wire of some alloy having a high electrical resistance and which is not readily oxidizable, such as nichrome (an alloy of nickel and chromium). It is properly insulated and protected from oxidation as much as possible, and usually placed in metal tubes which are completely immersed in the water in the boiler. The power used is regulated by varying the number of resistances which are connected in parrallel.

Electrode Boilers

For high tensions and large power consumptions electrode boilers only are used, as wire resistance would be too expensive and too difficult to install. Moreover, electrode boilers possess the following advantages over resistance boilers: greater safety because if too little water is fed to the boiler the power boilers there is danger of burning out the wire resis- consumption merely drops, while with resistance tances; automatic regulation is more easily obtained, either by varying the water level in the boiler, and consequently the degree of immersion of the electrodes, or by changing the position of the latter; much less scaling of the boiler, there being a slight deposition of scale on the electrodes, except when a high voltage is used, but never on the boiler shell as the latter is no hotter than the water itself. Electrode boilers are very easily cleaned, a simple washing being sufficient. It is thus seen from this standpoint electrode boilers are very advantageous.

On the other hand, these boilers have one serious drawback, which is due to the fact that the resistivity of the water varies within wide limits according to its origin, purity, and temperature. At 15° C. the resistivity of distilled water is more than 7,00 ohms per cubic centimeter, that of water from glaciers generally lies between 6,000 and 4,000 ohms, while that of river water can vary from 4,000 to 800 ohms and can even fall considerably below the latter value if it contains large amounts of dissolved salts. When water is evaporated, the concentration of the salts which it contains rises and may make the resistance drop to 300 ohms per cubic centimeter. The resistance also diminishes with rise in temperature, at least up to 100° C., and at the latter temperature it is only about half what it is at 15° C. It is therefore absolutely necessary to provide means for automatically regulating the power consumption and keeping it constant in spite of variations in the resistance of the water.

When using high tensions, the resistance of the water is not sufficiently high and the power consumption becomes too great for the electrode surface in contact with the water. There is then danger of arcing, which might cause dangerous short circuits. Up to about 3,000 volts there is not much danger of such an occurrence; but with higher tensions this is no longer the case However, the boilers at Bussi have been working for a long time at 6,000 volts and those at Brignoud for over two years at 6,500 volts, without any special devices, and no trouble has been encountered. (The Brignoud boilers have even worked several months at 7,000 volts.) This can be accounted for by the following facts: the water used at Bussi is exceptionally pure and the boilers are handled by an experienced staff; at Brignoud the water is of average resistance, but the boilers contain a very large amount of water and special precautions are taken in starting them (they are brought up to pressure slowly and regularly, and the electrodes are all of exactly the same dimensions to make sure that they are all immersed to the same extent), for it is especially at the start, when the water is cold, that there is danger of arcing and short-circuiting.

Direct current is never used with electrode boilers as the mixture of hydrogen and oxygen which would be produced by the electrolysis might be very dangerous. Our tests have shown that with alternating current there is but very little electrolysis, especially if the reaction of the water is not acid, and with low voltages there is merely a very slow oxidation of the electrodes when they are made of ordinary metal such as iron or copper. With high tensions, the arcs which are formed continually, except when special devices are used to prevent them, may decompose a small amount of water, but the amount must be very small, as the oxidation of the electrodes is still quite slow. For instance, at Brignoud the loss in weight of ordinary mild steel electrodes working at 6,500 volts was only 30 kilos for a consumption of one million kilowatt hours.

Other reliable tests carried out in various places

and more particularly in Switzerland by the Government railways, by the Sulzer company and by the Brown-Boveri company on a boiler using sixteen and two-third cycle current at 15,000 volts, showed that the production of explosive gases in electric boilers working on alternating current was practically nil.

Cost of Producing Steam in Coal-Fired and in Electric Boilers

As all the electric energy is completely transformed into heat inside the boiler, the only losses to be considered are those arising from heat which passes through the lagging of the boiler. By making the lagging sufficiently thick, it is quite easy to get an efficiency of over 95 per cent. Hence, the efficiency of an electric boiler depends only on its lagging.

The transformation of one kilowatt hour into heat produces 863 large calories. Taking into consideration the efficiency of the boiler, one kilowatt hour can produce approximately 1.25 kilos of steam when the feed water is cold (15° C.) and 140 kilos when the feed water is hot (85° C.). The production of the same amount of heat as is produced by the combustion of 1 kilo of coal at 7,000 calories would theoretically require at least 8 kilowatt hours. But in practice it has been found that only 2 to 5 kilowatt hours are required to generate the same amount of steam as 1 kilo of coal at 7,000 calories. This conclusion has been reached by Mr. Ruther, engineer at Oerlikon Le Génie Civil, Aug. 30, 1919). "It has been shown that in practice, owing to higher efficiency and better utilization, especially in the case of intermittent operation, it is seldom that 5 kilowatt hours are required to produce the same amount of steam as 1 kilo of coal; generally not more than 3 to 4 kilowatt hours are necessary, and there are cases on record where as little as 1 to 2 kilowatt hours have been used."

Assuming that 4 kilowatt hours are equivalent to one kilo of coal and that the cost of the latter delivered to the boilers is 80 francs per ton, the kilowatt hour can still be paid 0.02 franc. It is thus economical to pay as much for power for electric boilers as is actually being paid for the electrochemical industries, and the installation of large size electric boilers is far easier than that of an electrochemical plant.

Use of Electric Boilers

Of course large electric boilers can use only electric power generated from waterfalls, and only "waste power" at that; that is, power available at high water, at night, on Sundays and holidays, in other words, offpeak power. And moreover they are practically the only equipment which can utilize this power efficiently at the present time, for they can be installed at a moderate cost and are extremely flexible. After a few minutes small units give steam at working pressure, while even the largest units can be brought up to pressure in one hour at the most; and an accidental shutdown of the boiler merely causes the loss of a small amount of current which has but little value for other purposes. The power consumption can be regulated very easily, and it can be varied almost instantaneously within very wide limits.

In practically all the circuits which are fed by hydro-electric central stations there is more or less surplus power available. It would be in the interests of the producing companies to foster the installation of electric boilers, as this would appreciably increase their revenues with no increase in outlay. But many of them, especially in France, prefer to let power go to waste rather than sell it at a very low price, as they fear that this would give their clients an argument to justify the opinion, which is unfortunately too prevalent, that hydraulic power costs next to nothing.

Electric boilers are therefore used at the present time chiefly by plants which produce their own power and which also require steam. In these plants the cost per kilowatt hour is not considered, and the saving in coal consumption is very appreciable. Under such conditions it may be quite economical to use one or more electric boilers to keep up the pressure in coal fired boilers when the latter are banked; for instance, night power from a waterfall, which is practically valueless, can be used in an electric boiler which keeps up the pressure in coal fired boilers which are used only for emergencies or in the day time.

Such an installation has recently been completed in Sweden. The town of Malmoe is supplied with hydroelectric power from a 50,000 volt transmission line, and it also has an emergency steam station. To avoid having to burn coal continuously to keep the boilers under pressure, two Ruths steam accumulators have been installed, which can supply enough steam to tide over for a short time any interruption in the current. The two accumulators have a combined volume of 456 cubic meters, are almost completely filled with water, and are kept at an effective pressure of about 7 kilos (about 90 to 95 pounds per square inch) by means of an electric boiler which works only at night. During the day time the pressure drops by only about half a kilo. When the pressure falls from 7 kilos to 1 kilo, the accumulators give 36,000 kilos of steam, which can generate 3,300 kilowatt hours by means of a turbine specially designed to use steam under varying pressure.

In Italy, Switzerland and the United States electric boilers are coming into wide use for heating trains drawn by electric locomotives. These boilers are usually placed on a special car and receive the current directly from the trolley wire. Coaches built for steam heating can thus be used on electrified lines without any modifications whatever.

Some applications of electric boilers may seem quite paradoxical. For instance, it may be advantageous to use electricity for the generation of steam, which in turn is used for generating mechanical

power. In a paper mill, for example, it may be worth while passing electrically generated steam through a turbine before sending it to the paper machine dryers. The efficiency in such a case is at least as good as that obtained by using a transformer with an asynchronous motor in place of the turbine; for the electric boiler can work under a high tension at practically the same efficiency as a transformer; and the only losses in a turbine working under a back pressure are those due to radiation from the machine, and by proper insulation of the turbine these losses can be reduced to the same order of magnitude as the losses in an asynchronous motor.

Here is another example: the Frédet mills at Brignoud have a standard gauge locomotive for shunting in the yard. This locomotive carries 5 cubic meters of water, which is brought to pressure by heating electrically. It is started up when the pressure reaches 12 kilos (about 160 pounds per square inch), and can run continually for about 3 or 4 hours, until the pressure falls to about 3 kilos (40 pounds per square inch). Of course, the electric energy is utilized very inefficiently in this manner; but as the locomotive uses only power which would otherwise go to waste the mill finds such a use economical, especially as the machine is very powerful, easy to drive, and requires little or no attention for upkeep.

In many cases electric boilers can be used to advantage, even when the electricity is paid for at the same rate as for power, when steam is required in relatively small amounts or intermittently, that is, when the current consumption is relatively small. In such cases they are much superior to ordinary coal-fired boilers, and they possess the same merits which make electric motors so highly prized: cheap to install, little or no expense for upkeep, can be installed at the place where the steam is to be used, no smoke, great cleanliness, etc.

Small electric boilers can frequently be used, even when the current is generated by means of steam. This is especially practical when an accumulator, quite easy to install, allows of operating the boilers at such times as the load on the circuit is small, at night especially. At present this is about the only practical method of using offpeak power from central stations.

Conclusion

Electric steam boilers, which have come into practical use on a large scale since the war, are bound to come into wider use from day to day, as they are the means best adapted to use large quantities of hydro-electric power which would otherwise go to waste. They present a twofold advantage: they effect a very appreciable saving of fuel, and they can bring in an increase in revenue to the power company at practically no additional cost.

Small units have a very wide field before them. Their convenience and cleanliness, for which they are so highly prized, render their use possible even when the price of electric energy is relatively high (as, for instance, when it is generated by means of steam). Moreover, power companies are coming to realize more and more that it is to their advantage to foster the installation of large units so as to improve the load factor of their circuits.

Pointers for the Engineer

BY W. F. SCHAPHORST, M. E.

Pipe Headers

WHEN several prime movers are supplied by a battery of boilers a properly valved header, common to both the boilers and prime movers, should be employed to provide a flexible tie—allowing any boiler or battery of boilers to be cut in and out of service at will, thereby equally distributing the load on the remaining boilers. The headers should be carried by roller supports (about 12 ft. centres) to prevent sagging and to allow for expansion. The header should be securely anchored at the centre to divide expansion equally. Drips should be provided at each end to carry away the condensate. When superheated steam is used it is customary to provide a separate header to supply saturated steam to the plant auxiliaries. The best form of header is made from pipe with the required number of nozzles welded in and made integral with the header. The nozzles can be of any size, placed at any angle, and the ends of the pipe swaged down if desired. One-piece construction decreases the number of joints.

Draining Condensate

THE prompt and thorough removal of water formed by condensation is a very important factor. This is accomplished by drains installed at every point where, due to a rise in the line, the condensation may form a water pocket and cause water hammer with the possibility of destruction to the fittings and valves and fracturing of the pipe. Since the velocity of steam in the main is usually greater than a mile a minute the impact of the water of condensation which is picked up and carried along like a slug is equivalent to a heavy blow, resulting in excessive vibration and knocking, with the possibility of serious damage.

Size of Steam Pipe

SHORT steam pipe sizes can be selected by using this simple formula:

(1)

$$d = 13.5 \sqrt{\frac{M}{VS}}$$

Where d = actual internal diagram of pipe in in.;
M = weight of steam per min.;
V = allowable steam velocity, ft. per min.;
S = weight of one cu. ft. of steam.

For long pipes, knowing or assuming the pressure loss, use the above formula first, and then apply Babcock's formula which is:

(2)

$$87 \sqrt{\frac{PS_a d^5}{\left(1 + \frac{3.6}{d}\right) L}}$$

Where P = pressure loss in pipe lb. per sq. in.;
Sa = "average weight of one cu. ft. of steam.
L = length of pipe in ft.

Example

A 200 H. P. boiler is to be operated at 225 per cent rating at 200 lb. pressure. What size main, 200 ft. long shall be used, steam velocity to be 6000 ft. per min.?

200 H. P. × 2.25 = 450 actual boiler H. P. using 30 lb. steam per H. P. hour we get 13,500 lb. per hour = 225 lb. per minute.

Applying formula (1) and using 5 = 0.468 we get d = 3.82 in. A 4 in. pipe is the closest size. Then applying formula (2) and allowing a pressure drop of 5 lb. per sq. in. we get 222 lb. steam per min. which is close enough to 225 lb. for all practical purposes. A 4 in. pipe can therefore be safely selected.

Air Heaters

AS boiler pressures increase it appears that the air heater is finding a more prominent place in power plants than it has had in the past. The air heater utilizes the heat in chimney gases by making it heat the cool fresh air before it passes under the grates to support combustion.

According to Charles H. Merz, Consulting Engineer in England, who has had considerable experience with both air heaters and economizers: "An air heater gives less trouble than an economizer and is cheaper to operate. Bleeder feed heaters cause no trouble."

Ten Piping Rules

THE piping system in the paper mill, to fulfill its function properly, should be: 1—Safe. Dependable materials should be used throughout.. 2—Reliable. In important installations duplicate systems are often installed. Shut downs are expensive. 3—Longlived. Good materials insure long life and maximum ultimate economy. 4—Arranged for plant testing at any time. 5—Arranged for repairs or extension without crippling the plant. 6—Convenient for making repairs or alterations. 7—Liberally equipped with pipe bends to allow for expansion. 8—Correct in size—not too large and not too small. 9—Properly insulated. 10—Properly drained.

Common Sense Efficiency

By WILLIAM R. BASSET

President of Miller, Franklin, Basset & Company, Inc.

IT IS not good sense to spend a thousand extra dollars a year unless that expenditure will cut costs or increase profits more than that. Yet I have seen men so enamored of what they thought to be efficiency that they spent on frills three times as much as they could possibly make.

One for example, installed a mechanical conveyor requiring one man at each end, to do the material moving that had formerly been accomplished by one man with a hand truck.

Another paid the clerks in his cost department $40,000 a year to gather figures that may have been interesting, but certainly were not worth what they cost. By changing the system to give him just what he needed, and no more, a matter of $35,000 a year was added to his profits.

In another shop, expensive and highly specialized machines were installed because on long runs they were economical. The trouble was that in this shop there were no long runs, and the machines could not be kept sufficiently busy to show low costs. Cheaper and less "efficient" machines on which several diverse operations could be performed would have been better.

A shirt manufacturer found that his cutters were liberal, and for safety's sake, often made the tail of a shirt a quarter of an inch too long. He offered a bonus to his men to stop this waste, for he visioned a saving of thousands of yards of cloth a year. The saving materialized, but it was useless, for the length of cloth from which the shirts were cut was such that no individual piece of cloth saved was long enough to be used for anything.

Great savings can be made in the usage of labor and material; but common sense efficiency dictates that the game be worth the candle.

Be sober, be healthful and be safe, says the National Safety Council.

Annual Business Conference of the American Paper and Pulp Association

THE Fifth Annual Business Conference of the American Paper and Pulp Association was held at the Drake Hotel, Chicago, on October 9, 10 and 11, 1923. During the same week, the regular semi-annual meeting of the National Paper Trade Association was also held, and on Thursday morning, both associations met in a joint session, concluding with a joint luncheon.

This annual conference has become established as an event of great importance in the business year of the paper manufacturers and merchants. It is a time when all groups in the industry depend on being able to learn the truth about the country's business situation as it affects the paper industry, and in so doing, get squared away for another six months before the annual meeting in April, with manufacturers and merchants working together with one accord and in perfect understanding of each other's conditions.

The various manufacturers' associations which are subunits of the American Paper and Pulp Association, held their meeting during the same week. At that of the Gummed Paper Manufacturers' Association, the establishment of a collection department was decided upon. The success of the credit bureau established a year ago has been such that it was decided to take another step in advance by the inauguration of a collection bureau. Much time was consumed in discussing the problem of cost accounting and how to proceed to establish a cost committee to work out a uniform method of cost accounting. Definite action was left for later determination.

WOODLANDS MEETING

It was a little disappointing to note that the attendance of the Woodlands Section was comparatively small this year. Presiden C. W. Hurtibus, in opening, however, commented on the size of the meeting by saying, "Though the quantity here is small, the quality is large, which will balance things up, so this meeting which we are now starting, ought to be a great success."

The meeting opened at 10:30 o'clock. Mr. Hurtibus gave an excellent opening address, during the course of which he mentioned that the threatening Canadian embargo came, in a way, as a blessing in disguise. "It has stirred the pulp and paper men up to a realization that has been put off as long as it can be," he said, "we have got to start reforestation in this country on a large scale."

Mr. Hurtibus' address was followed by a short talk by Mr. O. M. Porter, Secretary of the Woodland Section. He brought out the fact which, in his belief, is that the Section is not yet performing the maximum service to its members along the lines of its purpose, owing to the members not coming together oftener and in a more practical way. He pleaded for local meetings to be held during the year, where the members could go out into the woods owned by the pulp and paper companies and study the situation at close hand. The suggestion was generally discussed with full concurrence in the advantages to be gained, but with some difference of opinion as to whether or not the meetings could be successfully arranged. The one thing that Mr. Porter laid stress upon was, that we haven't enough pulpwood in this country to last for long, and that the mill men have got to get together and solve the problem of reforestation.

Recommend Branch Office in Chicago

During the discussion following Mr. Porter's remarks, Mr. B. T. McBain, of the Nekoosa-Edwards Paper Company, reiterated a recommendation that was made at a previous meeting of the Section, that a branch office of the Woodland Section be established in Chicago, with Mr. Porter in charge. A resolution was offered by Mr. McBain and carried, to bring this recommendation to the attention of the Executive Committee of the American Paper and Pulp Association. In support of his contention that a Chicago office of the Association would be a very serviceable help to the mills in the Lake States, Mr. McBain told of a recent incident, when a delegation formed to obtain information on the forest situation in Wisconsin, obtained no valuable facts, owing to the manufacturers not having been previously informed as to what the

Banquet of the Salesmen's Association of the Paper Industry at the Drake Hotel, Chicago, Wednesday, October 10, 1923

committee was seeking, and being, therefore, unprepared to give the facts.

Mr. McBain related of the fact that taxes on land in Wisconsin were so enormous, that the owners of large tracts of land, worthless, except for the cultivation of timber, were giving the land back to the government, instead of meeting the taxation demand. He stated that immediate steps should be taken to put into effect legislation revising the taxes on timber lands. The method of timber land taxation should be to pay the tax when the timber crop was harvested, not before. Mr. Porter then informed that a meeting has already been arranged for the executives of mills to meet the state legislators to discuss this question, at Wausau, on October 23rd.

The topic of great damage resulting in forest fires was fully discussed. Mr. Porter read a Canadian newspaper clipping which said, that ten million acres, which were estimated at 75 million dollars, was lost in Canada last year by fire alone. That 19 trees were burned for every one cut for commercial purposes. Mr. Porter showed a chart which gave the figures of the pulpwood situation in the United States for the years 1922 and 1923. A comparison of these two years showed a large increase in the use of pulpwood in 1923 and also an increase in prices of the wood in the rough, peeled and rossed states. He stated that this condition will exist and will continue to get larger every year, until we have completely solved this all-essential problem of reforestation.

Dr. Raphael Zon Speaks on Reforestation

Dr. Raphael Zon, director of the United States Lake States Forest Experiment Station, next delivered an excellent address on the topic of forestry. He said that in time the Forest Experiment Stations will do for the forests what the Agricul'tural Experiment Stations are doing for agriculture. The average land-owning citizen in the United States thinks that idle land is good for one thing—the cultivation of crops. There are millions of acres of idle land going to waste in the United States on that account.

"We have passed the period when we may mine our timber, and have not reached the stage where the timber will be a national crop," said Dr. Zon.

The new station, to be located at the University of Minnesota, has just been established, and will devote a great part of its activity to the study of the growing of pulpwood for the paper mills of Wisconsin, Michigan and Minnesota.

How the station will carry out technical problems of silviculture was explained, and Dr. Zon expressed the belief that the future of tree growing in this country will be the manufacture of wood fibres into fabricated form, as building board, just as rubber is vulcanized into form for industrial use. Different types of boards, he believed, would be developed for various uses, and he added that the present method of cutting boards and timber out of trees would be looked back upon as a primitive form of the use of wood. All species of wood, he said, would in the future be ground up and converted into fabricated material, thereby avoiding the tremendous waste now incident to the use of lumber.

In conclusion, Dr. Zon asked that a paper and plup committee be appointed to co-operate with the Forest Experimental Station. This was put in the form of a resolution and adopted for recommendation to the Executive Committee of the Association.

Short Talk by Dr. Baker

Dr. Baker gave a short talk, in the course of which he spoke of the New England states having already taken up the forestry question, and that mill men in that section are co-operating with the state officials. He advised that we must refrain from any radical program in meeting this problem, but we must take the leadership and act wisely. "Unless we make adequate means for a constant supply, we will have to move to Canada," he said. We have enough land east of the Mississippi and north of the Potomac to supply the whole United States with pulpwood, if handled right. If we utilize this land to the best advantage, some day Canada will be coming to us, instead of we going to them.

Mr. Shepherd on Forest Management

In the afternoon meeting, Mr. Harold B. Shepherd, of the Eastern Manufacturing Company, gave an address on "Forest Management of Pulpwood." He told of a plan whereby his company will set out two thousand acres of young trees each year on their timber land. In Maine, he said, slash disposal is not a serious question. Slash there is an asset, in that it helps to retain moisture in the ground and gives the young trees a better chance to grow. The results in leaving the slash on the ground and helping the trees, greatly offsets the disadvantages from fires caused by it. The money that was previously taken for the disposal of slash is now used in fire protection work. The fire risks are just about as great, even though the slash has been taken away. He said that his company maintains a protective organization of one man for every twenty thousand acres of woodland. These men work in co-operation with the state and do nothing but travel through the woods, instructing campers about putting out their fires when they move, and keeping a sharp lookout for small fires which have started. Each man, he said, has averaged putting out from one to six fires a season, and that more than pays for their keep.

Mr. Shepherd said that the insurance companies in Maine are planning to give more study to the problem of insuring forest lands, and that a meeting for the purpose of discussing this has been arranged for this fall. Timber loss in Maine has been almost negligible for the last ten years, amounting to less than one per cent of the valuation of the land.

The system of timber taxation in that state is very helpful to woodland owners. Most of the forests are in unorganized townships and owned by private concerns. The taxes are collected by the state, who estimate and place valuations on the merchantable timber, and these have been quite low. In the organized townships the timber question is much the same as it is in the western states, but this has been taken up with the state and relief is expected soon.

Mr. Shepherd, in closing, said that the paper and pulp industry's time came several years ago to practice forestry, but not until recently did they know the real forest problem. The time is now here for the companies to reforest their land. He added that all through the New England states, intensive forestry is now being practiced.

Secretary Porter Talks on Practice of Forestry

Secretary O. M. Porter gave a short talk on the subject, "Is the Paper Industry Practicing Forestry?" He stated that from 60 to 80 per cent of the paper mills in New York, New England and the Lake States were dependent on the purchase of pulpwood from outside sources. He cited cases of some of the greatest pulpwood users in the United States, who have large tracts of land, but who do not have a single forester to look out for it. He said that many mills spend large amounts of money upon equipment for the mills but very few spend a cent on the most important thing in the whole paper industry: that of insuring a supply of pulpwood. He cited an instance where he once asked a prominent paper man what he was going to do to insure his having enough pulpwood for the years to come. "Why, that's the least of my worries," he replied. "I've got enough wood here to last me twenty years." In conclusion, Mr. Porter declared that the Woodlands Section will have served its purpose if it can do anything to quicken the mill men's employment of foresters to look out for the future timber supply.

On account of Mr. John E. Alexander not being able to attend the meeting, the talk he was scheduled to give on the "Results of Experiments in the Manufacture of Pulp from Inferior Wood," was given by B. T. McBain, of the Nekoosa-Edwards Paper Company, and Dr. J. D. Rue, of the Forest Products Laboratory, Madison, Wis. Mr. McBain declared that he would leave the greater part of the speaking to Dr. Rue, as he had made a special study of the question and was able to give a more interesting account. He said, however, that good pulp cannot be expected to be obtained from rotten wood, but that a great deal of the wood that is termed "rotten" is not rotten. Some of this wood makes a very good paper of the cheaper grade and can be utilized to a good advantage.

Dr. Rue told of experiments being made at the laboratory in Madison to determine the exact time that wood starts to decay and in this way help the paper makers by showing them just how far they can go in using what is generally termed rotten wood. He said that they were also seeking to find a solution of saving wood by knowing when it can be used after it had decayed. A certain per cent of rotten wood can be used and still turn out good paper, he continued. Just how much and under what conditions it can be used to advantage, is one of the problems that they are now working on. Dr. Rue's talk concluded the discussion of the Woodlands Section.

Novel but Practical Snow Motor

An interesting two-reel picture was next show by the Armstead Snow Motors, Inc., of Detroit, Mich., of their snow motor in action. This machine is of unique design, in that instead of having wheels as a means of propulsion, it has four large, elongated aluminum drums, with spiral steel grooves fastened on the outside. The drums are driven by a chain sprocket and revolve in just the opposite direction as that of a wheeled vehicle. As the drums revolve, the grooves pull it along on the snow or ice.

It was shown making all tests satisfactorily. It will keep on top of the snow bank instead of sinking in and therefore

is particularly well adapted for countries that have a heavy snowfall. It is steered by a bob sled attachment fastened in front.

This machine was invented by F. R. Burch of Seattle, but the patents covering it are now owned by Colonel H. H. Armstead, a mining engineer of New York. The present machine is equipped with a 55 H. P. Liberty motor, and is capable of developing a speed of 35 miles an hour.

Views were shown of it climbing steep hills, turning short turns, and hauling heavy loads—all of which it did successfully. The present machine is not built for extremely heavy work, but it was successful in hauling four sleigh-loads of long, heavy logs. The Armstead Company intend to manufacture a heavier type of machine for heavy duty work later.

MEETING OF SALESMEN

The meeting of the Salesmen's Association of the Paper Industry started with a luncheon on Wednesday, October 10th, in the grill room of the Drake Hotel. About sixty members, coming from the East and Middle West, sat down to the tables and in friendly terms discussed the issues of the hour from world series to trade conditions—mostly, of course, the latter.

The meeting was presided over by President J. L. Fearing, of the International Paper Company, New York City, who in his remarks said that the thing which is paramount in our minds today is what the business situation portends to be tomorrow and the next day and in the future. He said that there was no one better qualified to give authentic and up-to-date information on that subject than Dr. E. O. Merchant, of the Mead Pulp and Paper Company, Chillicothe, Ohio. Dr. Merchant was therefore called upon to address the meeting on the subject of "Business Forecasting with Special Reference to the Paper Industry." Charts were employed to bring out the fact that economic laws keep business constantly revolving around a cycle, which is composed of four phases: Depression, Revival, Prosperity and Liquidation. Dr. Merchant showed that we are now in a period of prosperity and that we still will be in this phase for several months to come. Conditions were never better in any other known period of prosperity than they are today. Dr. Merchant's address will be found on another page in this issue.

Salesmen's Banquet

About two hundred men and ladies attended the banquet of the salesmen in the Grand Ball Room of the Drake Hotel on Wednesday evening. President J. L. Fearing acted as toastmaster, and announced with regret the absence of the salesmen's champlain, Rev. George Craig Stewart, who, previous to the setting of the date for the salesmen's meeting had accepted an invitation to address a gathering in Princeton, N. J. President Fearing spoke of the educational and social features which always characterize the meetings of the different divisions in the Salesmen's Association, and that the success of the meetings of the Chicago and New York Divisions has been the result of changing them from monthly to weekly gatherings. A new division, he said, is to be established during the coming year in San Francisco, Calif.

Mr. Fearing remarked that the thing which is helping the salesmen most in these divisional meetings was the practice of discussing business fundamentals. The older men are telling the younger what not to do, and the young men are helping by giving out new ideas. The standards of salesmanship are thereby being raised, also the standards of companies—and those of the industry, and likewise the standards of government are being improved.

There are things to be overcome, however, such as ruinous competition, and to learn to avoid the mistakes of the past; to consider the other fellow. Mr. Fearing said that in the coming year there would be 200,000 tons of newsprint imported from Europe, made from wood which will cost in our money less than one dollar per cord.

The first speaker of the evening was Mr. George Evan Roberts, vice-president of the National City Bank, of New York, whose subject was: "The Economic Situation in America Today," which is published elsewhere in this issue. Quoting from a booklet called "An Apostle of Common Sense," the following description is given of Mr. Roberts: "To reduce George Evan Roberts into a single phrase, is to describe him as 'a messenger of common sense'; because of his fidelity to facts, of his dependence on facts, of his talent to ascertain facts and his genius to state them so that they can be understood.

"As an editor, as a writer of political platforms, as Director of the Mint in Washington, and as a banker in Chicago and New York, he has shown the way of sensible thinking to his countrymen."

A brilliant and inspiring address was the next number on the program, made by Hon. J. R. Files, of Fort Dodge, Iowa, who spoke on "Americanism." The evening's entertainment was concluded with dancing.

THURSDAY'S PROCEEDINGS

The Joint Session of the American Paper & Pulp Association and the National Paper Trade Association opened at the Drake Hotel, at ten-thirty o'clock on Thursday morning, October 11, 1923. There were present more manufacturers and merchants than had ever before attended a Fall Paper Conference. The president's remarks were brief and were confined more or less to points brought out in the printed message distributed among the members entitled "Continuing Prosperity in the Paper Industry." The full text of this report by the American Paper and Pulp Association follows:

Continuing Prosperity in the Paper Industry

"The marked increase in paper production in August as shown by the monthly production statistics now being compiled by the American Paper and Pulp Association in co-operation with its affiliated organizations, is the best evidence that the conservative optimism felt by the entire paper industry is fully justified.

"These figures, indicating in general a production well above the normal for the month were a reassuring evidence that the July drop in production, little below normal though it was, was merely the result of temporary conditions. The August production not only made up for the difference between the July normal and actual production, but was sufficiently high to establish a production total for July and August combined of more than the normal for those months. Eliminating the abnormally high production of these months in 1922 makes the 1923 summer showing even more favorable, as compared with a true summer normal.

"It is difficult to state just how much of the increase is attributable to the effort of manufacturers to anticipate a normal increased fall business, or wheher it is due to an increased demand now being felt at the mills. If we accept the assumption that stocks in merchants' hands have been maintained at a low point, then we are reasonably correct in saying that the greater part of the increase was due to an actual increase in demand. That this is true is shown at least in part by the data on shipments of paper which increased 14 per cent in August as compared with July.

"Some of the more optimistic authorities predict that the period from now until the middle of 1924 will be the most nearly normal period of activity that the paper industry has experienced since the war. This attitude is not sponsored by the Association, but is mentioned as evidence of the optimism felt in some quarters. Certainly there seems to be no reason to anticipate anything less than reasonably good business and continuing prosperity for months to come.

"In general, basic conditions seem to favor an upturn of all industries. Transportation problems are being met successfully, labor conditions are stable with increasing rather than decreasing wages, and foreign complications, if not favoring a better development of trade, are certainly not such as to warrant undue anxiety.

"The transportation situation should not be ignored by the student of business conditions. The more rapid handling of freight by the railroads has a direct bearing upon business conditions. The fact that there is now a shorter time in transit for raw materials, and between the manufacturer of the finished product and the consumer, is a factor to be carefully weighed when considering stocks on hand either of raw materials in the mills, or of finished products in the hands of the distributors.

"The general labor situation is satisfactory, with no surplus of workers, and at the same time enough of a labor supply to eliminate any immediate danger of such a labor shortage as would force existing high prices for manufactured goods to abnormally high levels.

"Some students of fundamental economics are coming to the belief that too much stress has been laid upon the possible effects of Europe's political troubles upon American industry. It is their further contention that conditions abroad are such that America's high cost of production, due largely to the high standard of wages paid in this country, can hardly enable the American manufacturer to sell abroad at a profit. With the stabilizing of Europe there may be low cost production abroad, due to the readiness of European labor to work for wages that an American workman would not accept, and an amount of production that would not require America's manufactured goods. Such stabilization, however, should give a buying power for American agricultural products that would increase the buying power of the American farmer.

"In any event it would appear that the future prosperity

of American industry will be increasingly dependent chiefly on domestic, rather than foreign conditions.

"It should be noted that for the first time since March prices of general commodities are showing an upturn. Special significance should be attached to the gain in relative value of agricultural products, and the resultant accentuated buying power of the middle west and south.

"The general business situation is well summarized in the latest review by an important New York bank which says the resistance of business and finance to a succession of untoward circumstances such as the threatening aspects of the controversies between Italy and her Balkan neighbors, and the disastrous earthquake in Japan, attests the fundamental strength of the domestic situation.

"Before referring to specific conditions in the paper industry it may be well to turn back to the Association statement of a year ago, when in its review of business conditions it outlined a situation warranting a belief in returning prosperity. That this was justified is shown by the production of paper in the first six months of the year. January production was larger than for any other month in the country's history. May broke all records, except that of January.

"After such a return of prosperity, and after such a volume of production only conditions approaching a boom could have prevented a seasonal decline in the summer months. That the July and August total, small though it was, as compared with the January-May figures, was above the sixty-day normal is only additional evidence of the basically sound condition in the industry.

"There have been difficulties in the raw material situation, such as the shortage and consequent high prices for ground wood pulp, due to low water. Imports of foreign pulp have recently been larger than ever before recorded. The possibility of an embargo on the export of Canadian pulpwood has disturbed the wood market. No recession of prices due to possible lower costs of raw materials can be anticipated.

"The situation in the various groups of the paper industry varies somewhat according to the grade. The fine paper demand is increasing, with stocks in the hands of printers and merchants below normal. In this field manufacturers anticipate very good business well into next year, if not through the year. Book papers are improving somewhat, with the temporary relief of the casein shortage, and the shipments in August showed an increase of 18 per cent above July. Wrapping papers have felt foreign competition severely, particularly in the offering of foreign papers of inferior quality to the American product. Paper board reflects an increased public buying of general commodities; this is seen also in the specialty papers used for food containers. The effect of the strike in the New York paper box factories is still problematical. Newsprint is keeping up a high production figure, and 1924 consumption may exceed even the high figure of 1923.

"In general there seems to be no doubt of the approach of a period of good general business, and the paper manufacturer can not fail to be favorably affected. This is particularly the case since the conservatism of the paper industry in the past twelve months not only prevented increases of prices such as would have caused a buyers' strike in this basic industry, but relieved the industry as a whole from the after effects of an unwarranted price inflation.

"The paper industry, therefore, is approaching the fall months with confidence, anticipating a continuing prosperity, and with no handicaps to overcome in getting away to a good start after the normal seasonal dullness of the summer."

The Business Program

The program of the meeting consisted of the presentation of the business situations as seen by the merchants and manufacturers, followed by talks on simplified practice and the simplification of paper sizes.

Fine Paper Situation

The Fine Paper Situation as seen by the manufacturers was covered by W. J. Raybold, vice-president of the D. B. Rising Paper Company, Housatonic, Mass. Mr. Raybold chose as his text the remark made by George Evan Roberts in his address at the salesman's banquet, "Nothing is fundamentally wrong with the economic condition today, but there is no reason why we should not have prosperity today." Mr. Roberts reminded his hearers of the fact that the largest factor in the country's business is its purchasing power. There are three big groups of American purchasers, namely, the farmer, laborer, and investor. He emphasized the message which is being promulgated through the public press that the purchasing power of the farmer has not been lowered by the low price of wheat as the latter is only 8 per cent of farm products and the excess corn crop made up for the loss on wheat. With respect to labor, it has never been more fully employed than today. The population has increased 15 per cent since before the war and the market is therefore increasing. As a proof of this assertion, figures showing the sales of one of the country's largest mail order houses, were given. The September sales of this particular house were $9,949,000, or an increase of nearly $2,180,000 over the same month of last year. So far this year there has been a gain of about $30,000,000 in this particular company's business over the same period of 1922. Mr. Raybold therefore pointed out that there was no room for a pessimist in this situation.

With respect to the fine paper situation, Mr. Raybold said that the manufacturers know exactly where they are. He spoke of a compliment having been expressed by another trade body that there is not a trade association in America which has more complete statistics regarding their business than the Writing Paper Manufacturers' Association. He said that consumption from January to October, 1923, was 86 per cent of normal, production 93 per cent and shipments 90 per cent. Stocks on hand showed but 34 days' supply. Inventories are less than those of January 1st. The forty-day shutdown in the mills in Holyoke during this summer has, of course, made an unusual condition. The normal production of these mills is about 750 tons per day, making a total shortage for the forty days of 30,000 tons. Mr. Raybold gave the four major elements in the cost of manufacturing fine papers as labor, pulp, rags and coal. Labor represents about 87 per cent of the cost per pound of paper, and this element today is about 16 per cent below the highest peak in wages. There is no evidence of the lowering of the price level of pulp, rags, nor coal, and consequently there is no reasonable reason why the manufacturing costs of paper will be lower. In conclusion, Mr. Raybold repeated the text, "Nothing is fundamentally wrong with the economic condition today, but there is no reason why we should not have prosperity today."

Coarse Paper Situation

The coarse paper situation as seen by the manufacturers, was covered by President Henry W. Stokes, of the York Haven Paper Company, York Haven, Pa. In a few brief remarks, President Stokes said that the percentages in his division coincided with the production figures of the writing paper manufacturers. The conditions in both divisions were about the same. There is every reason to believe that the prices of pulpwood will advance as transportation rates get higher owing to the forests receding farther and farther from the manufacturing locations.

Situation as Seen by the Merchants

The situation as seen by the merchants was covered very ably by Mr. J. A. Carpenter, of the Kansas City Paper House, Kansas City, Mo. The full text of Mr. Carpenter's address will be found on another page of this issue.

Simplified Practice

A very interesting discourse illustrated by lantern slides, on the subject of "Simplified Practice" was given by W. A. Durgin, Division of Simplified Practice, Department of Commerce, Washington, D. C. Mr. Durgin startled his hearers by prefacing his talk with the statement that in "thirty minutes he would save ten billion dollars." By the elimination of waste, he said, enough can be saved to pay the six million-dollar tax levy, and four billion dollars more. Forty-nine per cent of fabricated production in the United States, he said, is wasted through the making of a multitudinous number of varieties of different commodities. Bricks, as an example, have been made in fifty-seven different sizes, when it is known that the original standard was 2"x4"x8"; 11,000 varieties of piston rings are being manufactured; there were originally 14 standard sizes of the American flag and the latest figures show that there are now being made 289 different sizes and varieties, no one of them agreeing with the original 14 standards. As an example in wearing apparel, the famous known brand of Dunlap's hats are made in 3,684 varieties, but 90 per cent of the business in this commodity is done in seven styles and 10 colors.

By the process of elimination in a certain brand of food products, in decreasing varieties 89 per cent and the consequent reduction in sales effort of 73 per cent, advertising 78 per cent, and overhead 80 per cent, there was an increase in sales volume of 600 per cent.

The following recommended standard sizes of paper were made by the Bureau of Standards and the Division of Simplified Practice:

Basic size, 25x40; general printing, 26x29, 25x38, 32x44, 35x45½; book paper, 30½x41; forms and letters, 17x22, 17x28 and 19x24, and the doubles of all these.

The following resolutions from the Joint Committee on Standardization of the American Paper and Pulp Association and the National Paper Trade Association, was then adopted.

Simplified Practice Resolution

"Whereas, Secretary Hoover, of the Department of Commerce, has extended to associations of paper manufacturers, merchants, printers, publishers and others allied with the paper industry, the facilities of his department, particularly the Bureau of Standards and the Division of Simplified Practice, and

"Whereas, The American Paper and Pulp Association and the National Paper Trade Association are in hearty sympathy with Secretary Hoover's efforts to assure nation-wide elimination of waste, reduce costs, improvement of quality, betterment of deliveries and stabilization of supply.

"Be it hterefore Resolved, That these associations endorse the principles of standardization and simplification of paper sizes and weights as exemplified in reports of committees made to the general conference held in Washington June 19, 1923, and

"Be it further Resolved, That these associations stand ready to co-operate with the users of paper in making the specific recommendations of such general conference fully effective.

Simplification of Paper Sizes

Mr. John Sullivan, Secretary-Treasurer, Association of National Advertisers, Inc., gave an interesting talk on the objects and purposes of the simplification of paper sizes. Mr. Sullivan said that one of the biggest wastes in paper is in the magazine field, where out of 1,572 publications there are 441 different sheet sizes being used. He said that individualism is really not expressed by size, but by color of paper and the contents.

JOINT LUNCHEON

The Joint Luncheon of the American Paper and Pulp Association and the National Paper Trade Association followed the morning's conference, and was held in the ball room of the Drake Hotel. Only one speaker was on the program, Mr. C. H. Markham, president of the Illinois Central Railroad, Chicago, who spoke on transportation and business conditions today.

Mr. Markham said that the present day situation is beyond the problem stage; never before has there been such a general public understanding of the railroad situation. He said that the railroads, in every month of this year, have exceeded all previous tonnage. He lent no encouragement to the hope of reduced rates, stating in his reasons for this belief, that the cost of a freight car today is $2,300, as compared with $850 in 1914, and that of a locomotive $54,000 as compared to $18,500 in 1914. The task of providing increasing transportation facilities is ever growing, being 54 per cent higher this year in freight than in 1914, and 55 per cent higher in passenger service. The average cost to construct a railroad today, Mr. Markham said, is about $26,000 per mile. He said, however, that labor conditions are coming to be better; there is more desire on the part of the men to co-operate, and promised, that as far as his own railroad was concerned, they would provide all the transportation as time goes on, that business needs. Mr. Markham's address was received very enthusiastically, and this concluded the conference.

National Paper Trade Association Meeting

The semi-annual meeting of the National Paper Trade Association was held at the Drake Hotel, Chicago, October 8, 9, 10 and 11, 1923. The first two days were taken up with meetings of the committees of the association and the local division meetings.

The meetings of the Fine Paper Division and the Wrapping Paper Division were held on Wednesday, October 10th. Interesting programs were carried out in both meetings. An interesting discussion took place in the Fine Paper Division regarding the making of envelopes by the United States Government.

Mr. Ross Andrews, of the R. P. Andrews Paper Co., Washington, D. C., was appointed chairman of the committee to draw up an argument, setting forth the reasons why the Government should not print envelopes, and submit it to the Postmaster General; he was also appointed to represent the Fine Paper Manufacturers before any legislative committee which might be appointed to hear arguments on the matter.

A resolution was adopted endorsing the principles of standardization and simplification of paper sizes and weights, a copy of which is included in the account of the meeting of the Joint Conference of Manufacturers and Merchants in this issue.

The meeting of the Wrapping Paper Division was characterized by more or less keen optimism by mill representatives and caution on the part of merchants. A very interesting address on "Market Conditions and the Future of the Paper Business" was made by Lawrence E. Nash, manager of sales of the Nekoosa-Edwards Paper Company. As an argument that costs will not come down, Mr. Nash cited the four factors governing the situation—the easy condition in the financial market; the present high wages being paid for labor, creating a great potential purchasing power; stocks on hand being not excessive, and the proof as shown by the great increase in sales in one of the large mail order houses this year over the same period last year. Mr. Nash said: "If you ask me what you need that you have not got for good business, I could not answer you." He said that the tendency on the part of business is to lay stress on pessimism and not enough on optimism.

The Wrapping Paper Division went on record as endorsing the same resolution adopted by the Fine Paper Division recommending standardization and simplification of paper sizes.

The meeting on Thursday consisted of a joint conference with the American Paper and Pulp Association, covered elsewhere in this issue.

Paper Men Attending Fall Conference

A partial list of those attending the Fall Conference is here given:

P. M. Allen, Detroit Sulphite Pulp & Paper Co.
John W. Anderson, Empire Paper Co.
Chas. T. Andrews, Andrews Bros. Paper Co.
C. W. Atkinson, Fox Paper Co.
Edward P. Bagg, Parsons Paper Co.
J. S. Bagg, Millers Falls Paper Co.
John S. C. Bailey, Continental Paper & Bag Mills.
H. R. Baldwin, Hammermill Paper Co.
E. E. Barrett, Mead Sales Co.
J. S. Beach, Stevens Paper Co.
P. A. Beckjord, E. J. Stilwell Paper Co.
D. W. Bergstrom, Jr., Bergstrom Paper Co.
J. N. Bergstrom, Bergstrom Paper Co.
R. D. Bertschy, Miamisburg Paper Co.
James J. Blaine, Crescent Belt Fastener Co.
Thos. S. Bond, Appleton Coated Paper Co.
Warren Bullock, American Paper & Pulp Ass'n.
Henry Burgee, Neenah Paper Co.
Thomas J. Burke, Salesmen's Ass'n of Paper Industry.
E. H. Burton, A. P. W. Paper Co.
Geo. J. Cadwell, American Writing Paper Co.
Charles W. Chabot, Jr., Hammermill Paper Co.
Howard L. Cheney, Srere Paper & Pulp Co.
P. S. Church, G. H. Mead Co.
A. E. Cofrin, Ft. Howard Paper Co.
C. W. Collins, Cherry River Paper Co.
Harry Cooper, Cooper & Cooper.
H. J. Corwin, Ajax Paper Co.
J. H. Coy, Flambeau Paper Co.
Robert Craig, University of Michigan.
P. A. Curtis, American Writing Paper Co.
A. B. Daniels, L. L. Brown Paper Co.
Edward E. Darby, District of Columbia Paper Mfg. Co.
S. R. Davis, Dells Paper & Pulp Co.
F. M. Dickinson, E-Z Opener Bag Co.
John R. Diggs, Albemarle Paper Mfg. Co.
A. Scott Dowd, The Paper Industry.
J. C. Downey, National Paper Products Co.
Ernest Draheim, Rhinelander Paper Co.
T. D. Earle, Michigan Paper Co.
F. J. Edmonds, Wausau Paper Mills Co.
W. W. Enlow, Irwin Paper Co.
Herman Elsas, Continental Paper & Bag Mills.
William S. Epply, Hammermill Paper Co.
D. C. Everest, Marathon Paper Mills Co.
J. L. Fearing, International Paper Co.
Paul S. Fiske, The Parker-Young Co.
Chas. F. Forster, Robert Gan Co.
B. A. Franklin, Strathmore Paper Co.
Arthur Freeman, Fort Howard Paper Co.
B. A. French, Strathmore Paper Co.
E. B. Fritz, The Paper Industry.
A. E. Fuhlage, Beacon Paper Co.
L. E. Fuller, Lumber world Review.
Jos. H. Funke, F. Funke Sons. Co.
George K. Gibson, Wausau Sulphate Fibre Co.
W. K. Gerbrick, Central Paper Co.
S. E. Giles, Continental Paper & Bag Mills.
W. R. Green, American Writing Paper Co.
A. E. Grosmith, Paperson Parchment Paper Co.

C. F. Guild, Liberty Paper Co.
H. C. Hanke, Rhinelander, Wis.
E. J. Hansen, McClellan Paper Co.
Emil Hansen, Ft. Howard Paper Co.
Walter G. Hansen, Ft. Howard Paper Co.
R. B. Harbison, International Paper Co.
W. Lloyd Heath, H. G. Craig & Co.
E. H. Hoel, Carpenter Paper Co.
Jas. Hood, A. M. Collins Mfg. Co.
Albert H. Hooker, Jr.
J. P. Hummel, Hummel-Ross Fibre Co.
C. W. Hurtubis, Hammermill Paper Co.
J. E. A. Hussey, International Paper Co.
C. I. Irwin, Irwin Paper Co.
C. H. Jaite, The Jaite Co.
George S. Johnston, Great Western Paper Co.
H. T. Johnson, Midland Paper Co.
Frank A. Juckett, Old Colony Envelope Co.
O. E. Kiaer, Buck-Kiaer & Co.
Jacob Kindelberger, Kalmazoo Vegetable Parchment Co.
S. C. Knode, Albemarle Paper Mfg. Co.
W. W. Langtry, District of Columbia Paper Mfg. Co.
W. J. Lawrence, Western Paper Makers' Chem. Co.
S. G. Leitch, Gummed Products Co.
Saul Levy, E-Z Opener Bag Co.
R. B. Little, Birmingham, Little & Prosser Co.
W. H. Lloyd, Dill & Collins Co.
Malcolm B. Lowe, Lowe Paper Co.
M. H. Lund, Crystal Tissue Co.
A. George Lutz, Invincible Paper & Pulp Corp.
Stanley D. Lyle, Cascade Paper Co.
Russell S. Madden, A. W. P. Co.
F. W. Main, Worthy Paper Co.
I. J. Marcuse, Bedford Pulp & Paper Co.
Peter J. Massey, Sec. Am. P. & P. M. Supts.' Assn.
John Matthews, Jr., Bureau of Foreign & Domestic Commerce, Washington, D. C.
B. T. McBain, Nekoosa-Edwards Paper Co.
G. M. McCarthy, A. W. P. Co.
James Donald MacLaurin, Newton Falls Paper Co.
R. F. McElwain, Crocker-McElwaine Co.
J. S. Miller, Jr., Mead Sales Co.
Frank Mossteller, Kalamazoo Vegetable Parchment Co.
M. E. Moyer, West Carrollton Parchment Co.
Jas. B. Nash, Nekoosa-Edwards Paper Co.
Charles G. Neidel, A. W. P. Co.
A. H. Nevins, Miami Paper Co.
H. L. Nichols, Wausau Sulphate Fibre Co.
L. H. Nye, Eastern Mfg. Co.
J. W. Oakford, Cherry River Paper Co.
Chas. G. Oberly, Munising Paper Co.
Geo. Olmstead, S. D. Warren Co.
M. B. Olmsted, Fox River Paper Co.
W. M. Packer, The Hooven & Allison Co.
John H. O'Connell, Diana Paper Co.
R. H. Palmore, Yellow Pine Paper Mill Co.
C. F. Post, E-Z Opener Bag Co.
John H. Pott, Irwin Paper Co.
D. L. Quirk, Jr., Peninsular Paper Co.
W. D. Randall, Champion Coated Paper Co.
Francis G. Rawling, Forest Products Laboratory, Madison, Wis.
Courtney H. Reeves, Dill & Collins Co.
W. J. Raybold, B. D. Rising Paper Co.
A. C. Remley, Pattern Paper Co.
R. W. Remont, International Paper Co.
H. H. Reynolds, B. D. Rising Paper Co.
J. B. Rieg, Erving Paper Mills.
A. W. Roling, Irwin Paper Co.
Walter C. Ross, Mid States Gummed Paper Co.
John D. Rue, U. S. Forest Products Laboratory, Madison, Wis.
J. R. Russell, Marathon Paper Mills Co.
Henry D. Schmidt, Schmidt & Ault Paper Co.
J. L. Seiler, Warren Mfg. Co.
Harold B. Shepard.
John B. Shepherd, Peninsular Paper Co.
U. S. Silbar, Inter-Ocean Bag & Paper Co.
Lewis H. Sisson, Racquette River Paper Co.
Carlton W. Smith, Miamisburg Paper Co.
Edward C. Smith, Nashua Gummed & Coated Paper Co.
Edward N. Smith, Tuttle Press Co.
R. L. Stevens, Jr., Stevens Paper Co.
Henry W. Stokes, New Haven Paper Co.
N. S. Stone, Wausau Sulphate Fibre Co.
Ira T. Strand, Lee Paper Co.
E. P. Strong, Munising Paper Co.
Kimberly Stuart, Neenah Paper Co.
W. J. Sullivan, Grandfather Falls Co.
A. A. Tanyane, Paper Trade Journal.
Harold R. Telfer, Detroit Sulphite Pulp & Paper Co.
James B. Thayer, U. S. Envelope Co.
R. C. Tilden, International Paper Co.
A. E. Tyner, A. E. Tyner & Co.
H. K. Vinton, Paper Trade Journal.
F. H. Von Ullrich.
Guy Waldo, Flambeau Paper Co.
T. C. Walsh, Hollingsworth & Vose Co.
J. M. Ward, Detroit Sulphite Pulp & Paper Co.
A. N. Waring, Bayless Mfg. Co.
O. L. E. Weber, Watab Paper Co.
Johannes Westergaard.
G. W. Wetmore, Groveton & Claremont Co.
O. B. Wheeler, Diem & Wing Paper Co.
B. C. Whitney, Whitney Paper Co.
Fred P. Whitley, Howard Paper Co.
Warren Williams, Southeastern Paper Co.
James Wilson, 3d, Hooven & Allison Co.
Lloyd S. Wilson, The Paper Industry.
Norman W. Wilson, Hammermill Paper Co.
L. G. Wood, Northern Paper Mills.
E. F. Yulke, Continental Paper & Bag Mills.

List of Paper Merchants Registered

Among the paper merchants who attended the meetings of the National Paper Trade Association were:
R. P. Andrews, R. P. Andrews Paper Co.
F. H. Albershart, Johnston-Albershart Co.
Oliver G. Baum, R. H. Thompson Co.
J. G. Boshart, Peyton Paper Co.
C. N. Bicknell, Union Paper & Twine Co.
Arthur W. Blackman, D. F. Munroe Co.
Alvin Bodemer, Diem & Wing Paper Co.
L. R. Boswell, Minneapolis Paper Co.
W. G. Cleveland, E. C. Palmer & Co.
A. M. Curryer, Pratt Paper Co.
B. N. Coffman, Pacific States Paper Trade Assn
F. M. Couch, Blake, Moffitt & Towne.
Robert G. Clayton, Sheridan-Clayton Paper Co.
James A. Carpenter, Kansas City Paper House.
T. P. Chapman, T. P. Chapman Paper Co.
E. W. Church, Cincinnati Cordage & Paper Co.
Charles W. Dau, Carpenter Paper Co.
F. E. Floyd, Crescent Paper Co.
W. C. Dudley, Dudley Paper Co.
J. W. Evans, Standard Paper Co.
L. Evans, Cincinnati Cordage & Paper Co.
F. Forchheimer, Chatfield & Woods Co.
Fred F. Fox, Crescent Paper Co.
W. N. Gillett, Chicago Paper Co.
G. L. Green, Crown Paper & Bag Co.
Arthur C. Hall, John Carter & Co.
S. J. Hodgins, Central Topeka Paper Co.
H. N. Hearl, Quaker City Paper Co.
A. J. House, Union Paper & Twine Co.
Ed. F. Herrlinger, Union Selling Co.
George S. Johnston, Western Newspaper Union.
James P. Jensen, Brinn & Jensen Co.
Dean Y. Johnston, Chatfield & Woods Co.
F. T. Jamison, Interstate Cordage & Paper Co.
Sydney T. Jones, Hudson Valley Paper Co.
Fred Lowe, Henry Lindenmeyr & Sons.
Arnett W. Leslie, John Leslie Paper Co.
Frank P. Leslie, John Leslie Paper Co.
F.G. Leslie, F. G. Leslie Paper Co.
Perry W. Lesh, C. P. Lesh Paper Co.
V. H. Larsen, Crescent Paper Co.
F. W. Lotz, F. W. Lotz Paper Co.
W. F. McQuillen, A. Storrs & Bement Co.
Joseph H. McCormick, American Paper Mills Corp.
W. J. McLellan, Carter, Rice & Co.
James McCracken, Riegel & Co.
J. L. Murray, Mutual Paper Co.
C. E. Mack, Mack-Elliott Paper Co.
A. M. Miller, Central Ohio Paper Co.
R. W. Miller, Central Ohio Paper Co.
W. C. McLaughlin, Union Paper & Twine Co.
H. A. Mathewson, Paper Supply Co.
Louis J. Marshall, Marshall Paper Co.
H. J. Merickel, Toledo Merchandise Co.
A. T. Nesbitt, Cincinnati Cordage & Paper Co.
H. W. Newcomer, Cleveland Paper Mfg. Co.
W. F. Obear, Cree-Obear Paper Co.
William A. O'Hara, Diem & Wing Paper Co.
B. E. Reeves, Alling & Cory Co.
R. Roesch, Union Paper & Twine Co.

I. H. Reid, Diem & Wing Paper Co.
J. V. Rowland, Rowland Co.
W. Rindskopf, Rosenthal Paper Co.
W. D. St. Clair, Alling & Cory Co.
N. A. Schoenbucher, National Paper Trade Assn.
W. B. Stevenson, A. Storrs & Bement Co.
Thomas H. Scallan, Chatfield & Woods Co.
Fred Schlosser, M. & F. Schlosser.
S. L. Schwarz, S. L. Schwarz & Co.
George H. Strott, New York Paper Co.
F. W. Starling, Seaman-Patrick Paper Co.
Thomas F. Smith, Louisville Paper Co.
A. G. Stewart, A. G. Stewart Paper Co.
A. H. Seyler, Alling & Cory Co.
Arthur H. Smith, Alling & Cory Co.
Walter Seinsheimer, Seinsheimer Paper Co.
H. W. Schrick, T. P. Chapman Paper Co.
John Single, John Single Paper Co.
J. W. Towne, Blake, Moffitt & Towne.
G. D. Tayloe, Tayloe Paper Co.
W. W. Thompson, Chope-Stevens Paper Co.
W. S. Wilcox, Wilcox, Wilcox-Walter-Furlong Paper Co.
F. W. Wilson, Blake, Moffitt & Towne.
K. S. Warner, John F. Sarle Co.
E. L. Walters, Western Paper Co.
B. W. Wilson, B. W. Wilson Paper Co.
Sidney L. Wellhouse, National Paper Co.
C. J. Wittrock, Paragon Paper Co.

Twelfth Annual National Safety Congress

ABOUT 50 delegates from paper and pulp companies attended the Twelfth Annual National Safety Congress held at the Statler Hotel in Buffalo, N. Y., during the held at the Statler Hotel in Buffalo, N. Y., during the week of October 1st. This convention turned out to be the most successful annual meeting the Safety Congress has yet held, from the viewpoint of benefits accruing to the delegates of the various sections interested in eliminating hazards in industry and in reducing the number of traffic accidents.

At a special informal session of delegates to the Paper and Pulp Section, held October 3rd, much material progress toward the adoption of a standard safety code for the paper and pulp mills was made. Unusual interest in this code was manifested by all delegates.

Robert M. Altman of the Marathon Paper Mills Co., Rothschild, Wis., chairman of the Code Committee, presided at the special conference. The tentative safety code, formulated by the committee under the rules of procedure of the American Engineering Standards committee, was not taken up in detail as to form and composition but the decision was reached greatly to enlarge the scope of each section contained in the proposed draft.

The committee will meet two or three times before the next safety congress by which time, it is hoped, the code will have been completed and will be presented for adoption. Meanwhile the committee will endeavor to procure all the necessary information concerning provisions that are to be included in each department of paper mills from a safety standpoint.

The Code Committee will, during the course of the year, frame another tentative draft which will be sent to members of the American Paper & Pulp Association for suggestions and for ratification. The final tentative draft will be framed in accordance with the recommendations made by the members of the Association.

Election of Officers

At the regular meeting of the Paper and Pulp section held October 3rd, these officers were elected for the ensuing year: George Phillips, Champion Fibre Co., Canton, N. C., chairman; Franz Rosebush, Nekoosa-Edwards Paper Company, Port Edwards, Wis., vice chairman; Seth L. Bush, Crocker-McElwain Company, Holyoke, Mass., secretary.

Dr. Baker's Address

The forceful address of Dr. Hugh P. Baker, secretary of the American Paper & Pulp Association, on Safety in the Paper Industry, was greeted with an enthusiastic response by the delegates. Although there was little comment on it from the floor and although remarks were confined to words of appreciation and a vote of thanks to Dr. Baker, it was apparent that the delegates heartily approved the ideas expressed by Dr. Baker, particularly those relating to the need for more aggressive co-operation by the industries and of the various sectors of the paper industry.

During the course of his address, Dr. Baker departed from his paper to tell of his observations made while he traveled in Norway and Sweden and he explained what is being done there in the way of reforestation. In emphasizing that too little attention is paid in this country to the forests, he said that in the two foreign countries the paper and pulp manufacturers look to the mill through the forest and in this country they look to the forest through the mill.

Following are some extracts taken from Dr. Baker's address:

"The paper industry has been very responsive to the excellent work of the Paper and Pulp Section of the National Safety Council, and is deeply appreciative of the work of this Section. Safety in the paper mills, as you understand it, is not yet sold to all of the pulp and paper mills, and it is not to be expected that the sale will take place until educational work is done that will convince the mills of the desirability and the necessity of guarding efficiently the safety of the workers.

"There must be aggressive educational effort made in assuring safety to the industries, not only in the way of life and limb of the employee, but in the matter of raw materials, assured market, and a constant supply of labor of the right kind. The fundamental safety which every industry is seeking in the way of being able to so operate that there may come reasonable profit from funds invested and from service given, might well include another feature which is a factor difficult to measure and difficult to inject into the relations of men. This is the securing of harmonious relations between employer and employee, aggressive co-operation between the great industries of the country with their many common interests, and satisfactory and successful co-operation between the industries and the various phases of government with which they come into contact,—municipal state and federal.

Supply of the Right Kind of Labor Safety Factor

"Of the elements making up an industry, that of a satisfactory supply of labor is the one to which the average manufacturer gives the greatest thought over a given period of years. As in the case of raw materials, labor has been abundant and of fairly satisfactory character in the past in this country.

"For years we have been able to attract from European countries people similar to the original stock in this country and people easily absorbed into our industries. With the slowing down of immigration from the northern countries of Europe, and the great need of common labor, there has come into this country in the last twenty years many thousands of men and women from the eastern and the southern countries of Europe. These people, of a different blood, and brought up under different cultural conditions, have been much more difficult of amalgamation than the peoples from central and northeastern Europe. A certain slow amalgamation of these peoples is taking place, but there is greater need for educational activity with them. This educational need means that there is opportunity for the industries of the country to unite in efforts to make these peoples of southern European blood fit more satisfactorily into our industries.

"In many cases pulp and paper mills are located in isolated sections, and have been developed with labor from the local population. Gradually, however, as other industries have developed about the mills and as the southern Europeans have crowded into almost every section of the country, our people are faced with the problem of dealing with two radically different groups. It is far from safe to consider the future of the pulp and paper industry without considering the necessity of using the eastern and southern European, either in groups or in mixture with the older and native labor.

"One of the difficult problems which has arisen in using labor from eastern and southern Europe has been the apparent readiness of these groups to be led by agitators who are often unprincipled or who have radical leanings and connections. As a matter of safety, the industries could well consider seriously this question of just how labor is organized and led. In numerous cases, where radical leaders have been forced out, the problem of satisfactory contact with labor

has been a very different question from what it was with the radical leader in control.

"Labor is very much in the saddle in some of the foreign countries, and it behooves the industries of this country to study the results of labor's influence in politics in foreign countries that our own industries may at least be prepared for even more difficult relations with labor than now exist.

"After all, labor is a vital element in all of our industrial activities. Antagonisms must be broken down and efforts must be made to bring about harmonious relations. The human factor can never be handled, or its problems solved, in the way in which we solve problems of raw materials. Unfortunately there are still individual plants in various industries where labor is considered and handled as it was under the very different conditions existing in the Seventies and Eighties in this country and abroad. Education and understanding is doubtless the solution of the problem of the relationship between the employer and the employee, as it must be the solution of the problem of raw material and of market."

The address of Selth L. Bush, manager of research of the Crocker-McElwain Chemical Paper Manufacturing company of Holyoke, Mass., on the value of physical examination of employees in pulp and paper mills, which is in its pioneer stage in this country, aroused much interest among the delegates. (Mr. Bush's entire address is printed elsewhere in this magazine.)

At the conclusion of his address, Mr. Bush was asked some questions, the great majority of which were related to the attitude of the workman toward compulsory physical examinations. Mr. Bush replied that his company has found that the natural disinclination of applicants to undergo a physical examination has been overcome by the general programme.

None of the delegates stated a definite position on the matter, but it was intimated that many are sceptical about the thing and believe that labor in some localities does not take kindly to the physical examinations. It is said that labor, in some places, fears that it might result in throwing out of employment a lot of men who are getting higher wages.

The chief points discussed at the round table on paper and pulp mill hazards, were the prevention of slipping on wet floors and the safe handling of materials.

Two methods were suggested as having been used effectively to eliminate the slipping hazard. These were construction of a mesh wire in concrete floors, so that when the concrete wears down the mesh will prevent slipping and the use of wooden shoes.

It was agreed by the delegates that the best way of meeting the second problem is to employ intelligent and level-headed foremen and the selection of workmen according to the state of their intelligence in determining whether they should be permitted to go ahead on their own initiative.

Tentative Safety Code Presented

The Safety Code that is in the making has been arranged tentatively under these general departments: 1. The Yard; 2. Preparing Pulpwood; 3. Rag and Old Paper Preparation; 4. Acid Making; 5. Chemical Processes of Pulp Making; 6. Preparing Pulp for Paper Machine; 7. Machine Room; 8. Finishing Room.

The draft that was placed before the delegates for discussion contained 73 proposed sections and about 750 regulations. It is expected that when the Safety Code is in its final form, there will be a much larger number of provisions contained in it.

The first section of the tentative draft, which has been with all others submitted for constructive criticism, and in no way indicates a decision of the committee of manufacturers that it and other proposed sections shall remain in the proposed form and finally be adopted, pertains to the unloading and storage of pulp wood.

One of the proposals to be considered by pulp and paper men in this connection, is whether it shall not be required, where locomotive cranes are used for loading and unloading, that pulp wood be piled at a distance from the center of the track far enough to allow a clearance of 18 inches between the pile and the end of the cab of the largest locomotive crane in use, when the cab is turned at right angles with the track. If no locomotive cranes are used it is proposed that the minimum distance be eight feet, six inches.

Tentative sections pertaining to operative rules under this section of the Code include regulations covering chains for locomotive cranes and jammers, anchorage for jammers, unloading cars, hand tools, hand protection, safety instruction and walkaways. The safety instruction provision has been suggested with the view of requiring foremen to instruct men to be especially careful near chains and other link conveyors.

Regulations Governing Safety in the Yard

In the tentative programme for regulations governing safety in the yard, is a section devoted to the block pile. It is planned to include in this department of the Code regulations covering the arrangement of block piles, the removal of pulp wood, block pile storage, sprayers and operating rules.

A recommendation was made that to remove pulp from a block pile when frozen, an endless wire rope and ship's anchor be used in connection with the drum. Only experienced employees should be allowed to use dynamite.

Under the general heading of unloading and storage of raw materials, it is suggested that the Code include provisions relating to clothing, trucks, clearance and operating rules. The operating rules are designed to cover hazards arising in the handling of carboys, in the piling of pulp and the storage of various materials.

Regulations Governing Saws

Saws is the general heading that is proposed for the first section of rules under the Preparing Pulpwood department. In this section, under the tentative arrangement, would be contained rules pertaining to screens for gang and slasher saws, slasher tables, slasher drive belts, pulleys and shafts, the runaway to the jack ladder, guards below the table, conveyor chains and operating rules.

It is suggested that regulations relating to hand barkers comprise another sub-division in this department. In this section will be incorporated regulations for safety in the way of proper guards for barkers and methods for efficient and safe operation.

Other recommendations have been made that sections covering barker drums, splitters and chippers be included in this department.

One of the proposed recommendations to be included in the department covering rag and old paper preparation is that wherever possible all rags and old paper shall be disinfected by employees. This comes under the sorting room section. The other proposed section in this department of the code is concerned with shredder and dusting machinery.

Acid Making is the fourth general department of a tentative Code designed to include safeguards for the prevention of accidents in sulphur burning, acid plants and distributing lines, valves, storage tanks, etc.

Another department of the Code, it is suggested, should relate to hazards involved in the chemical processes of making pulp. One of the proposals in this connection is that individual gas masks should be available within 200 feet of the locations most needed and that they should be of such quality as to furnish adequate protection against sulphurous acid gas.

In this department, it is also intended to include provisions relating to chip bins, exits, blow-off valves and piping, blow pits, and various other rules governing operation. In the same department of the Code there are planned provisions relating to sulphate and soda processes and bleaching.

Preparing Pulp for Paper Machine is proposed as another department of the Safety Code. The suggestion is that this branch of the safety regulations deal with means of avoiding hazards in the ground wood process, pulp shredders and beaters and washers.

Machine Room Regulations

How to avoid accidents in the machine room will form the body of another department of the Code. Tentative plans call for the inclusion of regulations governing safety in general and in connection with presses and driers, calender stack, winding reels and rewinders.

Safety in the finishing room planned to be accomplished by the adoption of several rules in this connection.

We Get Most of Canada's Paper

The Paper Division of the Department of Commerce calls attention to the increasing extent to which the United States is absorbing Canada's production of paper. In 1921, 91½ per cent of the total came to the United States. This increased to 92 per cent in 1922 and 97½ per cent in the first half of 1923, leaving only 2½ per cent for all other markets outside of Canada. The consumption in Canada is from 120,000 to 130,000 tons per annum, approximately 90 per cent of production being sent abroad. Heretofore Australia has been the principal market out side of the United States. The reason given for this decline is the preference given paper from British mills.

Annual Exposition of Chemical Industries

THE Ninth National Exposition of the Chemical Industries at the Grand Central Palace, New York, during the week of September 17, 1923, far surpassed any display of its kind ever before held in the United States. Both in the number and scope of the exhibits and the number of people attending, the exposition established new records this year, reflecting the agreement which was reached following a controversy about the show, which occupied a good portion of the time of the trade immediately following the exposition last year, and which brought the entire chemical industry of the country with its almost unlimited resources back of the present exposition management.

The numerous exhibits, which occupied three floors of the big Palace, showed the varied character of the chemical industry and displayed the wonderful progress of the American industry to the best possible advantage. No industry has advanced with such giant strides throughout the world as the chemical industry, and its activities were enormously accelerated through the problems that came up for solution during the World War. Prior to the conflict it would hardly have been possible to present so thoroughly a representative display of chemicals and appliances without depending on the products of the industry in Europe, especially those of Germany. In some lines the Central European countries held virtual monopolies, this applying particularly to dyes and to precision instruments. This year's exposition showed conclusively that the United States has taken its place in the foremost rank of chemical and chemical appliance producers, and that our country is no longer dependment on foreign products in this category.

The chemical show this year was entirely American, and only the products of the United States and Canada were eligible for display. Especially were the exhibits of American-made dyestuffs interesting and significant, as they showed that Americans are now manufacturing colors equalling or surpassing those made in Europe and that consumers of such products in the United States are no longer obliged to look to Germany and other European countries for dyestuffs. Moreover, the exposition emphasized that American chemists and manufacturers have found means of duplicating everything that the Old World experts knew prior to the war, and that American chemicals and instruments today are unsurpassed in quality or accuracy.

Crowds flocked to the Grand Central Palace on every one of the six days the exposition held forth. As many as 10,000 persons visited the show on several single days, and the attendance broke all previous records of similar expositions.

A special program was arranged for each day of the show. Monday, the opening day, a group of interesting and educational motion pictures was shown in the conference room. Included in the films were those entitled as follows:

"The Story of Sulphur and How It Is Mined," by courtesy of the U. S. Bureau of Mines and the Texas Gulf Sulphur Company.

"Saving Coal in the Home," by courtesy of the U. S. Bureau of Mines.

"Snappy Shots of Chemical Warfare," by courtesy of the Chemical Warfare Service of the U. S. Army.

"Water Power," by courtesy of the U. S. Bureau of Mines and the Westinghouse Electric & Manufacturing Company.

"Talc Mining in Ontario."

On Wednesday the American Ceramic Society held a meeting in the conference room; on Thursday the Technical Association of the Pulp and Paper Industry held a meeting in the conference room, while on Friday, a meeting of the Technical Photographic and Microscopical Society was held. The motion pictures were repeated each day following and preceding the meetings.

Exhibits.

A good many of the exhibits at the exposition were of prime interest to pulp and paper men. Brief descriptions of these displays follow:

SHARTLE BROS. MACHINE COMPANY—This concern displayed a complete line of the Shartle quick opening valves which it manufactures at its plant in Middletown, O. D. H. Montville, eastern representative of the company with headquarters at Northampton, Mass., was in charge of the exhibit.

PENNSYLVANIA PAPER PRODUCTS COMPANY—This concern which makes a full line of fibre cans in plants in Philadelphia and Pittsburgh showed everything in the way of fibre cans.

THE BRISTOL COMPANY—This company had an exhibit of recording instruments produced by its factory in Waterbury, Conn., and featured the new Bristol Fuller valve for controlling the temperature of oils, gas, steam and water. The company's new electric tachometer for use on printing machinery was also on display.

TEXAS GULF SULPHUR COMPANY—The exhibit of this concern was featured by a number of interesting photographs showing the mining, handling, refining and shipping of sulphur. A complete display of samples of sulphur in all its forms was also shown. H. R. Wentworth, sales manager of the company, and A. S. Cosler and E. W. Meagher were in charge of the booth.

MATHIESON ALKALI WORKS—This company, manufacturers of heavy chemicals including some of those used by paper and pulp mills, had an interesting exhibit of chemicals. The company also showed its model bleach plant for paper mills, showing in a miniature way how the bleach liquor is prepared from liquid chlorine by the Mathieson system. The exhibit occupied three booths and was in charge of J. W. Boyer, sales manager of the company, and R. J. Quinn, assistant sales manager.

THE CRANE COMPANY—This company, whose headquarters are in Chicago, exhibited a full line of the Crane cast steel valves and fittings.

WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY—This concern had one of the most elaborate exhibits at the exposition. A West muffle furnace with automatic temperature control was shown in operation, also an automatic flasher designed for flashing any desirable length. An exhibit of metals for repairing broken pieces and for building up attracted a good deal of attention.

NASH ENGINEERING COMPANY—This concern exhibited the Nash hytor air compressor and vacuum pump as well as other designs of pumps and air compressors it manufactures in its plant at South Norwalk, Conn.

KARL KIEFER MACHINE COMPANY—This company showed among other machinery which it manufactures in Cincinnati, O., the Kiefer pulp filter.

SWENSON EVAPORATOR COMPANY—This concern exhibited its line of evaporators which it produces at its plant in Harvey, Ill., a suburb of Chicago.

THE DORR COMPANY—This concern's exhibit consisted of the Dorr Sewage Clarifier, which is utilized by various paper mills in the treatment of waste waters. A miniature clarifier showed how sewage and waste waters can be clarified and stream pollution eliminated.

MORSE CHAIN COMPANY—This company, with factory in Ithaca, N. Y., featured in its exhibit one of its regular standard spreading frame drives in full operation, and also had on exhibit chain drives in numerous sizes.

PROCTOR & SCHWARTZ, INC.—Manufacturers of drying machinery exhibited several of its immense drying machines, including a tray truck type machine for drying pulp boards.

OLIVER CONTINUOUS FILTER COMPANY—This company, with offices in New York, San Francisco and London, had an exhibit of its filters, including those types in use in paper mills.

THE UNION SULPHUR COMPANY—This company had an elaborate display of sulphur in all its various stages, together with a great many photographs showing how the mineral is mined, refined, shipped, etc.

STURTEVANT MILL COMPANY — Manufacturers of crushers, grinders, screens, mixers, conveyors, etc., showed its line of such machinery as is made in its plant in Boston, Mass.

UNITED STATES TESTING COMPANY, INC.—This concern had an exhibit which showed the broad scope of its activities, including sampling scientifically done by standard official methods, general laboratory work in the making of various kinds of analyses, chemical analyses of metals and alloys, coal and other fuels, gasoline, greases, soap, etc., as well as microscopical examination and physical tests of paper.

THE W. S. TYLER COMPANY—This concern featured its "Hummer" electric screen made in its plant in Cleveland, O., which screen vibrates at high speed by use of an electric magnet.

Other concerns having exhibits included the Arabol Manufacturing Company, of New York City and Chicago, manufacturers of adhesives of every variety; the Fleisher-Sturtevant Company, manufacturers of individual cooling and dry-

ing systems; the Uehling Instrument Company, manufacturers of fuel economy equipment; the M. W. Kellogg Company, manufacturers of piping, and the Vallez Rotary Filters Company, manufacturers of filters of Bay City, Mich.

The exhibit of American-made dyes was intensely interesting and attracted a great many visitors to the exposition. All kinds of textiles—silk, cotton and wool—in a large variety of patterns were shown dyed exclusively with domestic dyes, while the exhibit also included numerous samples of clothing, paper, tapestries in the dyeing of which American dyestuffs were employed.

The United States Bureau of Standards and the United States Department of Commerce had an elaborate exhibit showing the various minerals and chemicals produced in the United States and the innumerable uses to which these products are put in American industry.

Tappi Meeting

In the absence of Howard S. Taylor, president of the association who was prevented from being present, Secretary W. G. MacNaughton presided at the meeting of the Technical Association of the American Paper and Pulp Industry in the conference room at the Chemical Exposition on Thursday afternoon, September 20. About two score members and other interested persons attended the meeting. This meeting of the Technical Association was arranged to provide an opportunity for those concerns having exhibits at the exposition of interest to paper and pulp mills to explain to the paper and pulp mill technologists the workings of the machinery, equipment or systems manufactured by the exhibitors.

The program at the meeting consisted of the reading of six papers. The first paper was "The Standardization of Paper by Test," by Hubb Bell, of the United States Testing Company, Inc., of New York. The second was "The Preparation of Bleaching Liquors from Liquid Chlorine," by J. H. MacMahon, of the Mathieson Alkali Works, of New York.

Then followed the reading of a paper on "Silicate of Soda in the Paper Mill," by James G. Vail, of the Philadelphia Quartz Company. N. W. Sulzer, of Research Co-operation, of New York, read a paper on the "Application of the Cottrell Electrical Precipitator to the Pulp and Paper Industry." The last paper was on the "Mining of Sulphur," by Raymond F. Bacon, of the Texas Gulf Sulphur Company, New York, which was read by A. S. Cosler, Chicago manager of the company and formerly superintendent of the Marathon Paper Mills.

T. L. Crossley, of the Pulp and Paper Magazine of Canada, was on the program to read a paper on "The Attitude of Men to Educational Opportunities of Study in Pulp and Paper Mills," but was unable to reach New York in time to attend the meeting.

As the Chemical Exposition closed at the Grand Central Palace on September 22nd, plans for the 1925 exposition were already under way. At a meeting of exhibitors, the advisory committee and management on September 20th, preliminary arrangements for 1925 were made. The week of September 28th to October 3rd, 1925, and the Grand Central Palace, New York, were the time and place finally decided upon. Announcement was made at the close of the exposition on September 22nd that over seventy-five per cent of space on the first floor had already been contracted for in the 1925 exposition by present exhibitors. Broad changes and new developments for 1925 are already being considered in the formulation of early plans.

What Kind of Paint for Plant Interiors?

The Difference Between Paints from the Paper Maker's Standpoint

HOW important is the selection of a paint for the interior of a paper plant?

A few years ago the answer to this question might have been somewhat uncertain. Today there is little doubt about the role that interior paint is playing, in producing those all-essential attributes of light and cleanliness, which every up-to-date plant boasts.

How well understood, however, are the various types of paint and the very real differences between them—differences that have a vital bearing on the purposes which they serve?

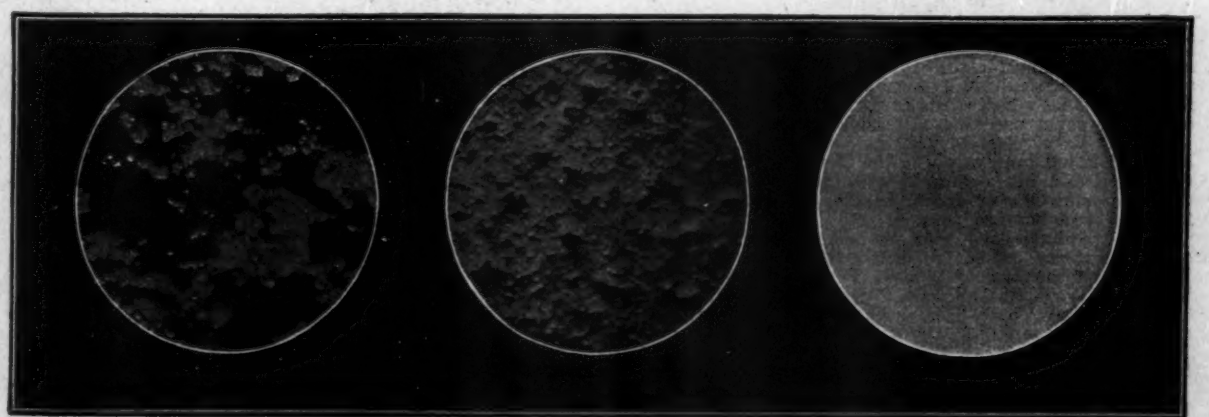
The answer here is less satisfactory. The number of cases of walls that become dull and gray, all too soon after a new paint job, is mute evidence of the fact.

This article is an attempt to explain simply and in untechnical terms the broad general distinction between the different types of paint. The subject will be viewed specifically from the standpoint of white paint which, for the obvious reasons of light and sanitary effect, is generally standard in the industry.

Interior white wall coatings, generally used today in paper plants, can be grouped into two distinct classes: oil paints, gloss, egg-shell and flat finish; and cold water paint or whitewash. As cold water paint and whitewash have practically become obsolete in up-to-date plants, we will simply touch on their use. Enough to say that such temporary wall coatings have neither binding nor penetrating qualities, so they cannot be expected to last very long. Flaking and scaling soon commences with the result that repainting is necessary shortly after application. Up-to-date paper makers who take pride in their plants have long since passed up these coatings as inefficient in every way. Although their initial cost is low, it is unusually high in the long run because of the inconvenience and expense of necessary frequent repaintings.

By far the most popular coating for ceilings and walls in paper plants is oil paint which can be grouped into two finishes, gloss and flat. There is what might perhaps be called a third class, a paint with a somewhat smoother surface than flat finish to which the term "egg-shell finish" is sometimes applied.

What, first is flat finish paint? It is, generally speaking, a paint in which the amount of pigment used is large, while the amount of the vehicle or carrier (an oil such as linseed) is relatively small. As this paint dries, the exposed surface is



Flat finish paint *Egg shell finish paint* *Gloss finish paint*

Paint surfaces photographed under powerful microscope—Each magnified to the same degree

largely pigment, the oil acting simply as an agent which fastens this pigment to the wall or ceiling.

What are the advantages of paint of this character? If we could eliminate the drawbacks of dust and dirt, it would have one advantage. Due to the small carrier element and the large quantity of pigment, it shows comparatively little tendency to "yellow," the point which must always be taken into consideration with white interior paint.

Unfortunately, dust, dirt and grime in the neatest paper plant cannot be eliminated, and the surface of flat finish paints offers an ideal resting place for it. The accompanying photomicrographs show this surface to be composed largely of the exposed particles of pigment. As the vehicle dries and partially evaporates, it leaves the surface rough and porous. Dust and dirt quickly collect on a surface of this character and is responsible for the tendency of flat white paints to lose their original white, light reflecting finish, and to show dirt marks and discoloration generally, soon after application.

It is, also, naturally a difficult paint to clean, either by brushing or washing. The more porous the surface, the more difficult to accomplish more than to drive the dirt further in.

Egg-shell finish paints have the same dirt collecting tendencies that a flat finish paint has, only, naturally, to a slightly less degree, because their surface is a trifle smoother as the photomicrographs show. At the same time, this type of surface cannot be cleaned much better than a flat finish paint.

How, then, do gloss finish paints compare with the flat and egg-shell finish type?

The outstanding and perceptible difference is one of surface, as all first class gloss, egg-shell and flat finish paints have practically the same degree of whiteness and light reflecting ability at first. The surface of all gloss finish paints, as shown under the microscope, is smooth and unbroken. It is formed by the hardening of the vehicle. To attain this result, a larger proportion of actual vehicle is used, and a correspondingly smaller percentage of pigment.

A surface is thereby obtained which avoids the dirt collecting disadvantages of flat finish paint. Therefore, to successfully resist the dirt and grime is a comparatively easy thing for a gloss paint under conditions found in the usual paper plant.

The result is that less repainting is necessary with a gloss paint, more light reflection is obtained over a longer period of time and a more sanitary surface results, because of its ability to resist all forms of dirt, germs, finger marks, etc.

Probably that feature which pleases the paper maker most is the washability of a gloss paint. A gloss surface when it does become soiled with age, can be washed clean like tile. There are no pores into which the dirt can be rubbed. Like a china dish, a gloss paint can be scrubbed and cleaned and, unless the paint has been allowed to go too far, practically the original white lustrous finish can be restored.

In choosing the paint for a paper plant, if the above arguments are taken into consideration, a gloss paint will be found most satisfactory under conditions typical of most paper plants. No paint can be expected to last forever, but if these recommendations are followed, the plant manager will have the satisfaction of knowing that he has made the best possible choice to insure long wear, sanitation and a clean up-to-date appearing place of business.

Paper Industry Is Invited to Advise with Department of Agriculture

Twenty leaders in the American pulp and paper industry have been asked by Secretary of Agriculture Wallace to form an advisory committee to work with the United States Department of Agriculture in formulating and carrying out its forestry policies which relate to the supply and use of timber in making paper and kindred products.

Hugh P. Baker, Secretary of the American Pulp and Paper Association, has been active in the formation of the advisory committee and has conferred concerning the matter with Chief Forester Greeley and E. H. Clapp, director of research for the Forest Service.

Those who have been asked by Secretary Wallace to serve on the advisory committee include George W. Sisson, Jr., President of the Racquette River Paper Company, Potsdam, N. Y.; Col. W. E. Haskell, Vice President, International Paper Company, New York; Stanley C. Bayless, Secretary-Treasurer, Bayless Manufacturing Company, Austin, Pa.; E. B. Murray, Vice President, Union Bag and Paper Corporation, New York; L. M. Alexander, President, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; D. C. Everest, Vice President, Marathon Paper Mills Company, Rothschild, Wis.; C. A. Gordon, Vice President, Oxford Paper Company, New York; Norman W. Wilson, Vice President, Hammermill Paper Company, Erie, Pa.; W. B. Nye, Vice President, S. D. Warren Company, Boston, Mass.; George W. Ostrander, Director of Finch, Pruyn & Company, Glens Falls, N. Y.; H. E. Fletcher, Vice President, Fletcher Paper Company, Alpena, Mich.; F. E. Bragg, President, Orono Pulp & Paper Company, Bangor, Me.; F. C. Clark, Vice President, Pejepscot Paper Company, Brunswick, Me.; David L. Luke, President, West Virginia Pulp & Paper Company, New York; A. C. Goodyear, President, Bogalusa Paper Company, Buffalo, N. Y.; Louis Bloch, Vice President, Crown Willamette Paper Company, San Francisco, Calif.; Grellet Collins, President, Dill & Collins Company, Philadelphia; O. Bache-Wiig, Vice President, Wausau Sulphate Fiber Company, Mosinee, Wis.; Henry W. Stokes, President, New Haven Paper Company, Philadelphia; Hugh P. Baker, Executive Secretary, American Paper and Pulp Association, New York.

Secretary Wallace states that the creation of an advisory committee composed of men intimately concerned with the pulp and paper industry will in his opinion insure thorough consideration of requests for advice as well as bring forth advice itself which would deal in a searching and practical way with the fundamental problems of the industry.

"The members of the committee, and through them the entire pulp and paper industry, should become more directly concerned in the development of forestry policies and in the conduct of our research work, whether that of the forest products laboratory, of the forest experiment stations, or along economic lines," said Secretary Wallace.

"Furthermore, I believe that in the long run such a committee ought to help materially in the department's relationships with the public in all matters concerning forestry practices and the utilization of timber and its products. In short, through the appointment of such an advisory committee I can see a splendid opportunity for an increasingly effective contact and co-operation."

Among the activities of the department closely concerned with the pulp and paper industry are the research in pulp and paper-making conducted at the Forest Products Laboratory at Madison, Wis., forest research in the growing of timber crops now under way at the various forest experiment stations, and the development of Federal and State policies for the production of timebr upon the country's forest lands.

Dryden Paper Co. in Receiver's Hands

The following letter has been circulated by the Dryden Paper Company, of Dryden, Ontario:

"Dryden, Ontario, October 5th, 1923.

"Owing to continued losses as a result of excessive competition and non-profitable prices from manufacturers in Northern Europe, the company finds itself seriously short of working capital, and in view of the large surplus of assets over liabilities (some $5,000,000), the directors of the company felt that in the best interests of creditors and shareholders the affairs of the company should be best served by placing it in the hands of receivers.

"This has been done, and as soon as an audit can be made of the company's books, and a statement prepared, a meeting of creditors will be held and an audited balance sheet presented for consideration.

"The last statement prepared by the company is dated August 31st, and is as follows:

ASSETS

Logs and pulpwood		$ 274,375.49
Manufactured stock		110,124.91
Stores and sundry supplies and equipm't		249,347.73
Accounts receivable		65,695.05
		$ 699,543.18
Timber limits, plant, etc.		$6,451,823.23
Deferred charges		3,737.31
Loss for 11 months		160,252.59
		$7,315,356.31

LIABILITIES

Bank loan		$ 613,873.77
Accounts payable		154,051.67
Interest on bonded debt		35,100.00
		$ 803,025.44
First lien notes		$ 304,000.00
Mortgage debenture stock		1,100,000.00
Note redemption reserve		3,166.87
Depletion reserve		38,384.00
Capital and surplus account		5,066,780.00
		$7,315,356.31

"It is the intention of the receivers to carry on the business until such time as it is possible to procure further working capital."

Enclosed Motors

By C. N. JOHNSON

General Engineering Dept., Westinghouse Electric & Manufacturing Company

FROM the standpoint of ventilation, motors may be classified as open, semi-enclosed, totally enclosed, and enclosed ventilated. The first is the standard motor with which we are familiar. Semi-enclosing covers are sometimes added to give mechanical protection to the motor winding, to keep out all but fine dirt or other matter and protect operatives from possible injury where the motor is located on the machine near the floor. The totally enclosed and enclosed ventilated motors serve two main purposes. Where dust, fumes or moisture, injurious to the windings, is present the enclosing feature protects the motor.

Where gases, dust or other inflammable material are present any fire in the motor will generally be confined to the motor, except in case of a self-ventilated motor where the air discharges directly into the room.

A study of the design, installation, and general reasons for using enclosed motors brings up a number of interesting considerations. In the design we must keep within certain prescribed limits of construction and installation of enclosed ventilated motors must be made in such a manner that the motor may function properly within the limits for which it was designed. In the application of these more expensive types of motors, we must see that common sense is applied rather than hasty judgment.

Limiting Rating Determined

The limiting rating of any motor is determined by the amount of heat which can be dissipated from the motor and still maintain all parts at a given specified temperature. In the open motor, air circulates over the windings and iron and helps to dissipate the heat from these parts. The enclosed motor, where no ventilation is provided, must depend entirely for cooling on the heat dissipated by radiation and convection from the external surface of the motor. It has been found that from 2 to 2.5 square inches of motor surface are required for each watt loss in the motor to maintain a temperature rise of 55° C. for continuous service. The heat to be dissipated is of course a function of the efficiency of the motor and the motor rating. For the smaller motor ratings, the external surface of the frame is comparatively large and very little change is made in the rating by making the motor totally enclosed. The surface per horsepower decreases rapidly with increase in motor rating so that there is a point beyond which it is not economical to go in totally enclosed motors.

The curves in Fig. 1 show graphically the relation between available surface for dissipating heat in enclosed and ventilated motors for different motor ratings. Curves a, b, and c show the external surface of standard open motors for different speed and horsepower. It will be noted that the external surface for a given horsepower rating is considerably larger on a 12-pole motor at 580 R. P. M. than it is on the 4-pole motor at 1750 R. P. M. The slow speed motor, therefore, lends itself more readily to enclosing. Curve d shows the external surface required for totally enclosed motors for practically all speeds.

By a comparison of the curves for the open and totally enclosed motors, it can readily be seen that the total surface required for enclosed motors rises so rapidly that beyond a certain rating it is not desirable or economical to build the enclosed motor.

To afford a better means of determining the cause of the diversion of the above curves, curves e, f and g are given to show the square inches of surface per horsepower for different ratings. Curve g for the totally enclosed motor would be parallel to the lower axis, except for the slight increase in efficiency as the horsepower increases. Curves e and f for the open motor fall off very rapidly as the horsepower increases, as can be accounted for by studying the following formulae.

Considering the motor as a cylinder and neglecting irregularities the surface of the motor is expressed:

$$\text{Surface} = \frac{11}{2}(2DL + D^2)$$

$$\text{Horsepower Output} = Kd^2l$$

Where d = diameter of rotor.
D = diameter of outside frame.
l = length of core.
L = length of motor over end bracket.

For a given number of poles the ratio of L to l is practically a constant, and the ratio of D to d is very nearly a constant and will be considered such for the present, so that

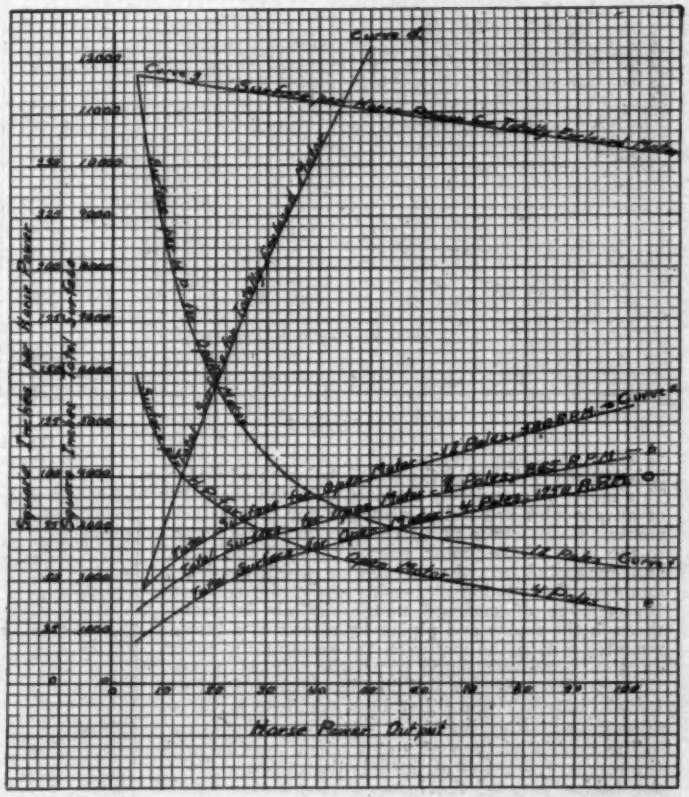


Figure 1

$$\text{Horsepower output} = KD^2L.$$

$$\text{Surface per horsepower} = \frac{11}{2K}\cdot\frac{(2DL + D^2)}{D^2L} = \frac{11}{2K}\left(\frac{2}{D} + \frac{1}{L}\right)$$

This equation shows that the surface per horsepower decreases rapidly as D increases or as L increases with the horsepower. These curves and formulæ show that at the higher ratings the increase in size of the enclosed motor over that of the open motor is too great for practical consideration.

It is possible to reduce the physical size of the totally enclosed motor by increasing its heat dissipating surface by the aid of numerous projections or ribs on the frame and brackets. Such a special frame would greatly increase the cost of manufacture and would tend to make the motor very awkward for handling. The field of the totally enclosed motor is therefore limited to the smaller ratings, preferably below 25 horsepower.

Ventilating Enclosed Motors

When the enclosed feature is required on the larger ratings

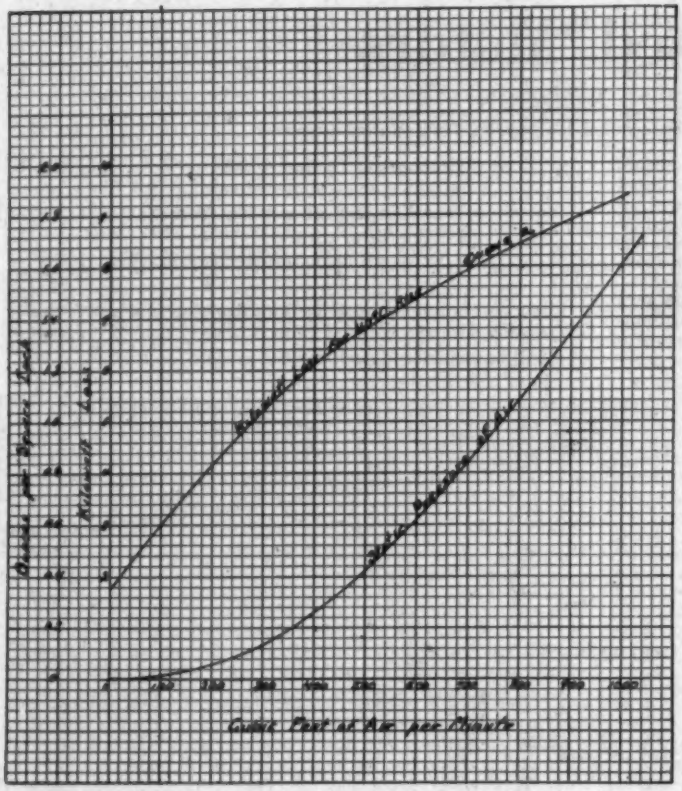


Figure 2

it is necessary to go to the ventilated type of motor. This motor is completely enclosed with the exception of an air inlet and outlet arranged for pipe attachments. Clean air is piped from an available source to the inlet of the motor, passed through the motor and exhausted into the outlet pipe which carries it again to the outside atmosphere. In the self-ventilated type of enclosed motor the air is passed through the motor and piping by means of a blower mounted within the motor on the revolving member. In the forced-ventilated type the air is passed through the motor and piping by means of an external blower driven either by a separate motor or mechanically from the motor itself.

The ventilated type of motor when supplied with the proper amount of air affords the same conditions for taking care of the losses in the motor as obtained in the open type, so that the same size motor frame can be used as for the open motor. It is of particular importance to see that the air supplied is pure and the volume is maintained to keep the proper motor temperature. This means that the ventilating system must be considered as a vital unit of the power equipment.

As a means of determining the amount of air to use and proper ventilating conditions, tests have been made on both enclosed-ventilated motors under conditions of varying air pressure and volume of air, the results of which are shown in curves, Fig. 2 and Fig. 3.

The data as given are taken from tests on a 100 H. P., 3-phase, 60-cycle, 8-pole, squirrel cage motor. The motor frame was completely enclosed with the exception of a 7-inch inlet in the lower part of one bracket and 8-inch outlet in the upper part of the opposite bracket. Provision was made internally on the inlet end so that most of the air passed over the windings on the inlet end, across the stator iron, through the windings at the opposite end and out through the opening in the bracket. Air was supplied by a separately driven blower with provision for changing the speed and thus controlling the quantity of air supplied. Temperature runs were made on the basis of keeping the temperature of the primary iron at approximately 40° C. rise. Figure 3 shows the relation between the quantity of air required and the kilowatt loss in the motor, also the pressure required to supply a given amount of air to the motor. The point where the curve a crosses the vertical axis was obtained by closing both inlet and outlet of the motor and running it as an enclosed motor.

It will be noted that the radiation from the outside of the frame in this case takes care of 1.7 Kw. loss, whereas with 900 cu. ft. of air per minute delivered, the losses were 8.9 Kw. or over five times that of the enclosed motor, showing the advantage in rating to be gained by use of the ventilated motor.

The fact that curve a, Figure 2, is not a straight line shows that the losses do not increase directly with the quantity of air delivered. The two principal factors which affect the shape of this curve are, first, the increase in velocity of the air, and second, the change in the dissipation of heat from the external surface of the motor. In order to show the effects of these two factors, curves are plotted in Fig. 3 against the velocity of air over the primary core. Curve a, Fig. 3 is plotted on the cubic feet per kilowatt basis for 40° C. rise and is worked up from the losses absorbed by the air alone. The losses absorbed by the air were calculated from the rise in temperature of the air from inlet to outlet, from the relation that .555 watts per minute raises the temperature of one cubic foot of air (at atmospheric pressure and 25 degrees C.) one degree C. The increase in the cubic feet of air per kilowatt with increase in velocity is due to the fact that the faster the air moves over the heated surfaces the less will be the heat absorbed by each cubic foot of air. By subtracting the watts absorbed by the air from the total watt loss in the motor the watts dissipated from the external surface of the motor were found, and from this figure the watts dissipated per square inch of surface were obtained and shown by curve b, Fig. 3. The heat thus dissipated decreases with the increase in velocity of the air, due to the fact that the air passes between the external parts of the motor (frame and brackets) from which dissipation takes place, and

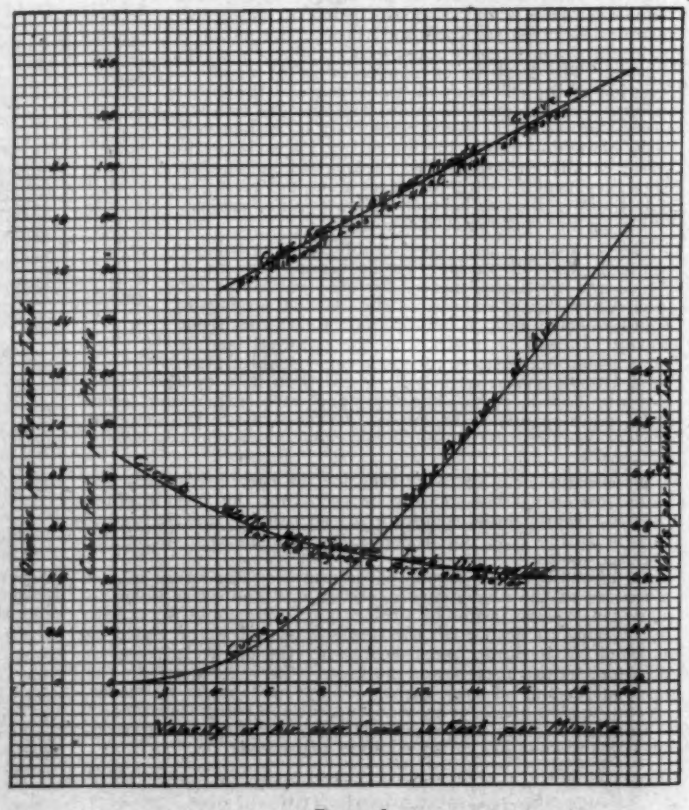


Figure 3

the core and windings in which the heat is generated. The amount of heat then dissipated from the frame and brackets is received from the air within the motor and varies with the temperature of this air. As explained above, less heat is absorbed by the air per cubic foot due to increase in velocity, with the resultant lowering of the temperature of the air, and consequently the decrease in heat transmitted to the frame and brackets to be dissipated into the atmosphere. This is, of course, based on a constant temperature rise on the heat-producing parts.

From the curves a and b, Fig. 3, the amount of air required to maintain a temperature rise of 40° C. for continuous service can be obtained; curve b giving the approximate allowance to be made for external dissipation per square inch of motor surface, and curve a the cubic feet of air per minute for each kilowatt of the remaining losses after the external dissipation is subtracted. These curves should be used with a factor of safety, as variation in motor construction and distribution of losses in the motor will affect the results to some extent. For temperature rises of less than 15 degrees C. above or below 40 degrees it will be sufficiently accurate to vary the values from the curves inversely with the temperature rise for the cubic feet per kilowatt and directly with the temperature rise for the watts dissipated per square inch.

Piping System for Enclosed Motors

Careful consideration must be given to piping of the air to and from the motor. The blower and piping should be of ample size. The volume of air required and the friction loss in the motor may be obtained from the motor builder. It is advantageous to furnish the motor manufacturer with as complete data as possible as to the conditions under which the motor is to be used, an idea of the distance which air will have to be piped; information as to the temperature of the air surrounding the motor, as well as temperature of the incoming air. Very often it is possible to ventilate several motors in an installation from one source of air supply. As an example of the power required to supply ventilating air it will be of interest to note that in the above tests on the 100 H. P. motor there was required 180 watts to drive the blower supplying the ventilating air, which is about ¼ of 1 per cent of output of the motor. This will be increased where air has to be brought any considerable distance through pipes.

The writer wishes to call particular attention to the self-ventilated motor and the limitations of its use. Here the comparative ratings of the self-ventilating motor to the open motor, on a given frame, will depend entirely on the amount of air which the blowers provided on the motor will handle through the necessary piping. The space inside the motor for mounting the blower is limited. The higher the speed of the motor the more will be the capacity of the internal blower. Good engineering practice limits the use of motors for self-ventilation to speeds above 700 R. P. M. so located that the total length of piping for inlets and outlets combined shall not be more than 25 feet and these pipes to be of sufficient size that the air velocity in the inlet pipe will not exceed 1000 feet per minute.

Comparing the Costs

It will be seen from the foregoing that the manufacture and installation of enclosed motors, both totally enclosed and enclosed ventilated present no serious problem. The important problem is the solution of the question as to when the use of the enclosed motor is justified. Naturally the cost of the enclosed motor is higher per horsepower than the open motor. For the totally enclosed motor we have seen from the above, curves that the physical size increases rapidly and we would expect the cost of the motor to follow very closely with the physical dimensions. The totally enclosed motor can be installed as readily as the open motor and the only additional point to be remembered in this connection is the fact that the totally enclosed motor is special and is not ordinarily carried in stock so that longer shipments are required. The totally enclosed motor is not interchangeable physically with the same rating open motor and this must also be taken into account on individually driven equipment.

The enclosed motor for forced ventilating will have a first cost of from 5 to 10 per cent above the cost of the same rating open motor. The cost of the self-ventilated motor will depend entirely upon the conditions of application. In this connection it would not be desirable for a machine builder to supply his equipment with a self-ventilated motor not knowing the conditions surrounding the ultimate installation.

In the cost of the forced-ventilated enclosed motor there must be considered the cost of the blower equipment and the piping for carrying the air to and from the motor. It must also be remembered that this additional blower and piping equipment must be kept up as a part of the power system and charged to power maintenance. The installation of the necessary piping brings in further considerations which must be kept in mind. Where cold outside air is brought through the pipes into the room, moisture will collect on the air pipes. This is very often taken care of by controlling the temperature of the incoming air in some manner. Very often the space into which the motor equipment is placed is limited and there is no convenient place for installing the air piping.

It has been found advantageous in most industries to divide the power supply into smaller electrical units replacing the larger sizes of former years. This has resulted in the very general use of motors on individual machines all of which has been economically advantageous to the various industries. We must be careful, therefore, in any changes which we make in the motor equipment, that we do not unnecessarily increase the cost of installation and maintenance of these small motor units to the point that we lose the advantage which they have given us.

Fire Risks Slight in Open Type Motors

In the case of squirrel cage induction motors where protection of the motor is contemplated in the presence of inflammable dust or other material, we should not pass hasty judgment that enclosing is the only solution of the protecting problem. With proper supervision and cleaning, the squirrel cage induction motor could hardly be classed as a fire risk in most applications for such industries as flour mills, grain elevators, or woodworking plants.

A very striking illustration of the change in attitude of those interested in the operation of motor drives in a large industry is that in the textile industry. When it was first suggested that individual motors be located on the various machines in the cotton mills, there was considerable agitation looking toward the totally enclosing of these motors. This was due to the possibility of setting fire to the lint from the cotton which gathered on all of the machines, and which would constitute a fire risk. The motor manufacturer contended that with proper attention, making sure that bearings were kept in proper shape and that material was not allowed to accumulate unnecessarily around the motors, that there was no appreciable danger from fire. The education of the mill men to this view point has proven the manufacturer's contention and the agitation for enclosed motors has entirely disappeared.

Adjustable Speed Motor Drive for Paper Cutters

In the advance which the paper industry has been making toward electric drive, the great tendency has been toward electrifying machines which require larger units where large

Figure 1

savings in power or greater savings in production can be shown. However, great thought is now being given in some mills to electric drive on auxiliary and finishing room machinery.

Fig. 1 shows a battery of 20 cutters which were changed from belt to motor drive with an increase in production in excess of 25%. The increase was made possible by a greater

range of operating speeds easily obtainable, fewer paper breaks and more flexible control of cutters.

The scheme of mounting was to build a platform above the lay-boys on which were mounted the motors and controllers. I beams were mounted on the lay-boy supports and on pipe stands as shown in Fig. 2 and a plank floor built on top of them. The motors were mounted on slide rails and belted to cutters. With this platform method it is possible to inspect electrical equipment very readily and make minor

Figure 2

changes right on the platform. Also the electrical equipment is up out of the way where it cannot be injured or operators come in contact with it.

The motors used are of the adjustable speed current type, rated 5 h. p., 800 to 2000 r. p. m., manufactured by the Reliance Electric & Engineering Company, which give proper speed range to get maximum production when cutting any size sheet or kind of paper the mill may be asked to produce.

The controller mounted on the platform above the operator performs all the functions of operation automatically. The operator has a push button at her right as shown in Fig. 2

Figure 3

which has Start, Stop, Slow, Fast, Inch and Safe points. On her left she has a rheostat by which running speeds throughout the range of the motor can be obtained by simply turning the handle. The Slow point is a thread-in point which so controls the motor that it runs at a reduced speed for threading paper through machine. It has been found possible to have a single operator do this work where formerly three were necessary. No clutch need be slipped for this operation. Also when running at high speeds, it is possible to press the Slow button and slow down the motor for a few minutes when operator needs more time for inspection or picking out defective sheets. When the Fast button is pressed, the motor speeds up to predetermined running speed. When the Stop button is pressed the motor is stopped quickly and smoothly by means of dynamic braking. With this method of stopping it was found that when packs of paper piled within the tapes, the machine could be stopped with the loss of only one pack, whereas with mechanical drive two to four packs were always lost.

The push button and rheostat are connected with flexible cables and move forward and backward with the different size sheets, so that they are always convenient to the operator. Another push button having Stop, Inch and Safe points is placed near the rolls. The Inch point differs from the Slow in that motor runs at threading-in speed only as long as button is pressed. When the Safe button is pressed motor cannot be started from second button until Safe point is released.

Fig. 3 illustrates substantial mounting of control panel and the very good wiring methods used in this mill. The control is of the time limit type so arranged to give a constant tension on the web of paper throughout all operations, and causing fewer paper breaks than any other method.

Standards Committee at Work

By B. T. McBAIN
Third Vice-Pres. Superintendents Association

THE Joint Standards Committee of the Superintendents, Technical and Cost Associations, 15 in all, five from each, forming five separate committees of three, one from each one of the organizations, is at work.

There are five subjects:
Sulphite Standards
Sulphate Standards
Soda Pulp Standards
Groundwood Standards
Bleached Pulp Standards.

The work outlined includes standards for everything from the kind of digester to the finished product in the beater for the paper mill, but does not include the various grades of paper, it being considered of just as much importance that 100% targets be set up for each one of the pulp industries named, that the manufacturers may "Shoot at," and then later provide the Standards for paper machine operation.

Each one of the five committees will meet and organize separately for their own particular work, then vote upon a general chairman for the entire or Joint Committee of Fifteen.

Mr. B. T. McBain was appointed chairman of the five from the Superintendents' Association at the Springfield convention in June with power to arrange with the Technical and Cost Associations for their co-operation and appointment by them of five each.

The Committee on Groundwood is composed of: Mr. C. A. Jasperson, of Nekoosa Edwards Paper Co., Port Edwards, Wis.; Mr. S. C. Brayton, Consolidated W. P. & P. Co., Wisconsin Rapids, Wis.; Mr. B. T. McBain, Nekoosa Edwards Paper Co., Port Edwards, Wis.

The Committee on Sulphite is composed of: Mr. B. T. Larabee, of S. D. Warren Co., Cumberland Mills, Me.; Mr. V. E. Fishburn, of Groveton Paper Co., Groveton, N. H.; Mr. J. E. Hyde, of Cumberland Mills, Me.

The Committee on Soda Pulp is composed of: Mr. J. G. Ramsey, of Dill & Collins Co., Philadelphia, Pa.; Mr. G. K. Spence of New York and Pennsylvania Co., Johnsonburg, Pa.; Mr. E. J. Fitzgerald, of Philadelphia, Pa.

The Committee on Bleaching Pulp is composed of: Mr. John A. Bowers, Hammermill Co., Erie, Pa.; Mr. A. D. Wood, Champion Fibre Co., Canton, N. C.; Mr. W. F. Bromley, of Erie, Pa.

The Committee on Kraft Pulp has been named but all those named have not yet accepted the tasks set and will not be named to the public until all have been heard from and accepted.

It is hoped that this Committee of Fifteen will give to the industry a set of standards of value to all, that there may be more unity of purpose in the industry and co-operation between the pulp and paper maker, the chemical control man and the cost accountant, all three of whom are as essential to the industry as the three legs of a three-legged stool.

The different departments of the American Paper and Pulp Association have been asked to help start the work by supplying to the committee copies of all standards and work thereon done by them to date that there may be no duplication.

The Manistee Filer Fibre Company have started operations at their plant in Manistee, Mich. A 150-inch Fourdrinier has been installed by the Beloit Iron Works. They will manufacture an uncolored, pure, sulphate Kraft, which will be produced in all standard weights of sheets from 25 to 120 pounds in rolls and sheets.

"Agitation" at Eddy Paper Mills

FIBER packing cases of all sorts and sizes are the modern product of the modern plant of the Eddy Paper Company, at Three Rivers, Mich. The cases are here made complete, from the manufacture of the fibre board itself to the fabrication of the finished cases, imprinted with the labels for the goods they are destined to contain.

The waste paper from which the fiber board is made is sorted on the top floor of the stock house, where all foreign matter is eliminated, and is then fed by conveyor belts to the stock chests for softening by water and mixing by agitation.

The stock chests are four in number, of oval form, Fig. 2, extending from the top or fourth floor down to the main floor. On twin vertical shafts in each chest, Fig. 3, are the agitator arms by which the stock is mixed and kept in flotation. The shafts pass downward, Fig. 1, through stuffing boxes in the bottom to the drive gearing below, Figs. 4 and 5.

Fig. 2. Top of one of the stock chests

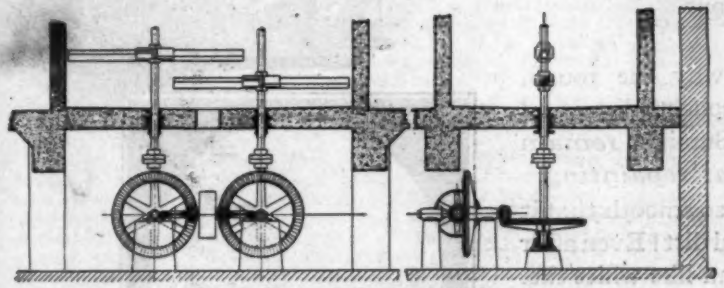


Fig. 1. Sectional elevations of the agitators

parted above the gearing with flange couplings, which provide for removal of either the agitator shafts proper or the gear-carrying sections below in case of necessity. Fig. 5 shows between the couplings the gate valve by which the stock is drawn off from the chest above.

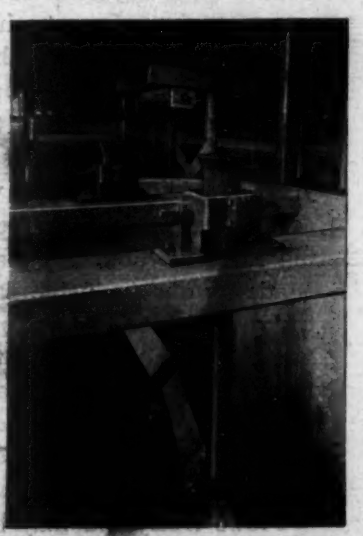


Fig. 3. Looking down into the agitators

In the basement of the paper mill building are several batteries of stuff chests, in which the stock is stored and agitated while passing from one to another of the various stages of beating and refining into readiness for the paper-making machines.

Fig. 5. Detail of the agitator gearing

The entire agitator equipment is heavy and rugged, as obviously required by the work to be done. Each vertical shaft carries several sets of agitators, consisting of two wood arms bolted to a cast hub. The downward thrust of the shafts is carried by step bearings below the main gears, Fig. 5. The drive is by belt from an alternating current motor, Fig. 4, to a pulley placed at the middle of a countershaft, from which double reduction gearing makes the connection to the low-speed vertical agitator shafts.

The complete agitators and driving gear sets are completely the product of the Hill Clutch Company, of Cleveland, Ohio. The six bearings for the three horizontal shafts of the agitator and driving gear sets are plain, rigid pillow blocks, fitted with grease cups. Bearings for the vertical shafts are oil lubricated. Bevel gears and pinions are of large pitch, with cast teeth.

The vertical shafts are

Fig. 4. Twin gearing and motor drive for one set of agitators

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The Arabol Manufacturing Company of New York City held its Annual Outing and Picnic on Friday, August 24th at one of the beaches in Brooklyn. Several motor busses were chartered by the company to take the picnickers to the beach in the morning and bring them back again at night. It proved to be a delightful outing, enjoyed by the officers as well as workers.

Before you paint

Read these astonishing facts

ON this page is shown one of the most amazing paint experiments ever made. It explains why Barreled Sunlight is being used today by leading paper plants throughout the country.

Three types of paint were examined and photographed through a powerful microscope.

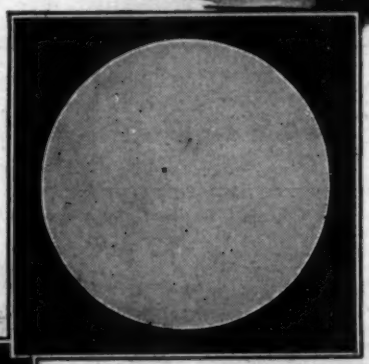
Note the difference!

These photographs show clearly why the rough, porous surface of most white paints collects dirt—and why interiors painted with Barreled Sunlight *remain clean and white without frequent repainting.*

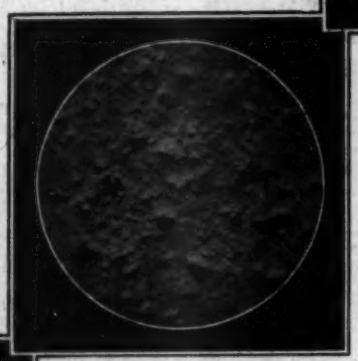
The surface of Barreled Sunlight is so smooth that it resists the smallest particles of dust and dirt! Even after years of service, it can be washed clean like white tile.

Barreled Sunlight produces a lustrous, light-reflecting finish without the glare of ordinary gloss paints. Made by our exclusive Rice Process, which removes the yellowing tendency from the oil, it is guaranteed to remain white longer than any gloss paint or enamel, domestic or foreign, applied under the same conditions.

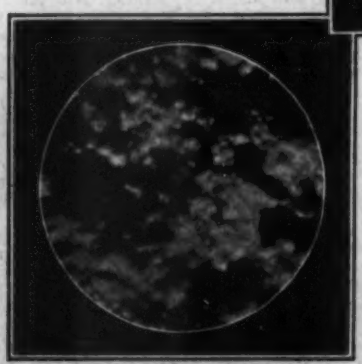
Flows freely and may be applied by brush or spray. Will not chip or scale. For places where excessive heat or fumes prevail, Chemic Enamel, a special form of Barreled Sunlight is recommended. Where more than one coat is required, use Barreled Sunlight Undercoat. Sold in barrels and cans. Send for our booklet, "More Light."



BARRELED SUNLIGHT



EGG-SHELL FINISH PAINT



FLAT FINISH PAINT

These illustrations show 3 paint surfaces as they were photographed through a powerful microscope.

Smooth enough to the naked eye—notice how rough and porous flat or egg-shell finish paint is when magnified! *The surface of Barreled Sunlight is smooth and unbroken, even under the microscope.*

"Save the surface and you save all"

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Barreled Sunlight

THE RICE PROCESS WHITE

The Economic Situation in America Today*

By GEORGE EVAN ROBERTS
Pres., National City Bank, New York

I HAVE been invited to talk to you about economic conditions, which have been much disturbed over recent years. It is now more than nine years since the beginning of the great war, and nearly five years since the armistice was declared, and the world has not yet found its way back to normal and settled conditions. The war was like a great earthquake in its effect upon world relations. In Yokohama and Tokio the wires and the railroad tracks, by which those cities had communication with the outside world, were disconnected, the water pipes, which may be likened to established channels of trade, were broken up, and so the connections and established relationships between countries were broken and industry and business everywhere suffered disturbance by the war.

The world before the war, had developed a great system of mutually beneficial trade. Western Europe, densely populated and highly industrialized, was the center of the world's exchanges, constantly receiving great quantities of imports, chiefly raw materials and food stuffs, and paying for them by sending out manufactured goods. The war caused an interruption and disorganization of trade from which all countries are still suffering.

In Europe, the old Austro-Hungarian empire has been broken up into several new nations; international boundaries have been changed in many places, new customs boundaries have been raised, with the result that industry and trade throughout Europe has been affected. Before the war, Russia was an important factor in Europe. It supplied a great quantity of raw material and food stuffs to western Europe, and was a great market for the industries of western Europe. Since the war, Russia has been almost non-existent as far as trade was concerned. It might be thought that since Russia was the chief competitor of the United States, as an exporter of food stuffs, the disappearance of Russia might be to the advantage of the American farmer; but on the whole, the state of this organization has been so disastrous that, as we know, the position of the American farmer has not been as good as it was before. As an illustration of the far-reaching effects of this disturbance of trade, take the relations between Russia and a country on the other side of the globe, India. Russia and India had very little trade directly with each other, but one of the principal exports of India is tea, and before the war the most important tea-consuming country was Russia. The Russians were a great tea-drinking people. The Indian tea crop was sold mainly in London and London paid for it with cotton goods made in Lancashire, England, the greatest manufacturing center of cotton goods in the world, and the raw cotton for those goods came from the United States. On the other hand, London exported the Indian tea largely to Russia, and took pay in Russian products; raw materials for British industries and food stuffs. There was a circle of trade before the war; now see what happened. The inability of Russia to buy Indian tea affects the ability of the people of India to buy cotton goods, and since India is the biggest single market for British goods, the falling of that demand gave Lancashire, in 1921, the worst year it had had since the American civil war. The inability of Lancashire to take raw cotton, caused the price of cotton to fall from 43c a pound, in 1920, to 11c a pound, in 1921, and that loss of purchasing power in southern states affected all the industries of this country.

Too Much Wheat

Our relations with Europe in the past have been mainly through our exports of farm products. We have developed agriculture with a view to supplying the foreign demand. We have always produced more of most of the staples than we could consume at home, and during the war we increased that production in order to make up for the falling off of supplies from Russia. We had about 47,000,000 acres in wheat in 1913, and we ran that up, until in 1919 we had about 75,000,000 acres in wheat. So you see that we increased our dependence upon Europe as a market for wheat. Our farmers had apparently counted upon the absence of Russia as a competitor, and that might have been all right if there had been no other competitors, but other countries have done the same.

Canada never produced more than 200,000,000 bushels of wheat in a year prior to 1913, but this year the official estimate for Canadian production is 470,000,000. The increased production of Canada alone, is enough to make up for the total disappearance of the Russian exports, to say nothing of our increased production, and increases in Argentina and Australia. Moreover, Russia is reappearing as an exporter; how much she will have for export this year, nobody knows, but it is a factor in the market. And finally, agriculture in central and western Europe has revived and the importing countries are either producing more wheat or producing more of something else that serves the purpose.

And so it is, that we have too much wheat this year, and the price is low, and times are bad in the wheat country. And when times are bad in any part of the country, or for any class of people, all sections and all classes feel some effects from it. It is a fundamental truth, that the highest state of prosperity for anybody can be realized only when all classes and all occupations share in it together.

We feel the low price of wheat down in Wall Street, both directly and indirectly. It is felt in all the lines of business that center there, and it is felt in another way, for whenever anything goes wrong anywhere, Wall Street has to take the blame for it. So we have more than our share of grief because of it. Furthermore, whenever conditions for any region are bad, there is always a demand that something be done about it, and the remedies that are proposed are always measures that would make conditions worse, rather than better.

Now it is true, that for the last several years, business has been laboring under difficulties. First, we had the great slump of prices in 1920, and in 1921 the business depression in which every line of business took heavy losses. The main trouble has been that, whereas, when prices were rising, everything went up fairly well together, but they did not come down together, and the old relations between the different lines of industry have not been restored to this day.

A state of prosperity is a state of balanced relations between industries. There is a normal equilibrium which must exist between the industries in order to have prosperity. All business, in the last analysis, consists of an exchange of goods and services, and you cannot have a free movement of goods; you cannot have employment for all the people, unless the relationship between the industries is such that the products of every industry will be taken and consumed by the people in other industries. The industrial situation must clear itself through the exchanges, and in order to do that you must not only have production in right proportions, but the services of the various industries must be valued to each other in right relations.

Now the fact is that agriculture, ever since the break in prices in 1920, has not had fair treatment in the exchanges. Owing to the fact that farm products are largely dependent upon world prices, and the further fact that labor in other industries is highly organized and has been able to resist wage reductions, the prices of what the farmer has to sell have fallen farther than the prices of what he has to buy. That is his real grievance today, and there is a basis for it. It is not fair that the farmer should feed the town populations at the pre-war price level, and for everything he must buy, have to pay 50 to 100 per cent above pre-war prices.

Farmer Better Off Than Year Ago

The farmer feels aggrieved by this situation. He wants to do something about it. He looks to Washington for help, but I do not think he will get any help from Washington. It is a labor situation. The difference between the prices of what he sells and what he buys is not in the profits of manufacturers, or middlemen or bankers. It is in the wages that are paid for every service that labor renders, and I don't think that situation is going to be remedied by any Farmer-Labor party or any combination between Magnus Johnson and Samuel Gompers. In the past year we have had a general revival of industry and business. For one thing, although agriculture has not come fully into fair relationship with other industries, it has made very substantial gains over its position in 1921. On the whole the farmer's position is better today than a year ago and far better than two years ago.

In large part, the recovery has been directly due to a revival of construction work. The difference between good times and bad times is largely in the amount of construction work under way. We fell behind in construction work during the war because everything had to give way to our war industries. Our population had been growing and under the pressure of necessity, in 1922 and 1923, we had had a great campaign of house building over the country. There is scarcely another industry whose activities affect so many industries as house building. It reaches backward into all the building material industries, and forward into all the home furnishing industries, and involves a very wide distribution of money. The railroads have not made the normal expenditures for improvements and equipment, and in 1922 they began large outlays for equipment, which have been

*Addresses delivered at the Banquet of the Salesmen's Association of the Paper Industry, October 10, 1923, at the Drake Hotel, Chicago.

"When the New Man Took Charge of the Board Mill"

"He proved to us that he could produce a better board at a lower cost. We were skeptical at first but the results proved him right on every count.

"In the first place he eliminated foreign matter in the main breaker beater. He enabled us to use centrifugal instead of plunger type pumps for handling the stock in the chests, which meant a big saving in power and space. He made possible an actual refinement of stock in the beaters, relieving the load on the jordans and he reduced the wear and tear on the agitator equipment and saved cleaning time. In whole he gave greater production, saved in the amount of equipment required, in power, help and floor space and made a better board. He did it by installing a Murphy Continuous Beating System."

Full information regarding breaker beaters with a continuous attachment for Murphy Continuous Beating systems may be obtained by addressing a letter or card to

Valley Iron Works Company
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Builders of:. Niagara Beaters, Valley Iron Works Holland Type Beaters, Washing Engines, Bleaching Engines, Stuff Pumps, Centrifugal Pumps, P.A. P.A. Rotary Screens for Pulp and Paper, Complete line of wood-room equipment.

Builders of heavy duty beating engines and agitator equipment, stuff and centrifugal pumps, Murphy Stock regulators and shower pipes especially designed for board mill use.

He Proved to Us that he could Produce A Better Board at a Lower Cost

continued in 1923. They are spending over $1,000,000,000 in 1923.

Automobile production had been restricted for several years and a good many people had fallen one or two models behind. They have wanted to catch up, with the result that industry is making an extraordinary record this year. Furthermore, in some sections of the country they have been getting automobiles before they got roads, and we have under way great expenditures for road building. With these activities and others stimulated by them there came a revival of confidence and natural reaction from the extreme economies and depression of 1921. When the great slump was under way nobody knew how far it would go; what depths it would touch; how long the depression would last, or who would survive. Everything was involved in uncertainty. And if we looked abroad the situation was worse there than at home. In every other crisis we have experienced we have been able to get some relief from Europe; they would buy our securities, and we could count on them to buy our staple products; but in 1921 there was question whether they could ever buy the foodstuffs they needed to keep them from starving. Out of that state of depression we have come and, whatever happens, we are never going back into it again. We know where we are now; we have touched bottom and have solid ground under our feet again.

Now, I don't mean that we will have unvarying prosperity in the future. Prosperity, I have said, is a state of equilibrium —of balanced relations between the industries. The truth is that never for very long do we have a perfectly balanced state of business. We are generally overdoing it or undoing it in some way. There is a tendency to swing to extremes first to one way and then to another.

There is the psychology of the crowd—and infection of the crowd—a tendency to move en masse. In every period of boom times speculation becomes a factor and obscures the situation; people lose sight of actual values and of all the standards and landmarks by which their judgment is ordinarily guided.

I am reminded of a story that Mr. Bryan used to tell of a man who was addicted to drink. A man was remonstrating with him about it and said, "Why don't you, when you know you have had enough and are asked to take another drink, ask for something that is not intoxicating, ask for something like 'sarsaparilla?'" "Well," John said, "that sounds well enough, but when I get that far along I can't say 'sarsaparilla.'"

And so in booming times, when prices are rising and it looks easy to make money by buying something on credit, there are a lot of people who get into the condition where they can't say sarsaparilla. The average man doesn't want to pay his debts so long as prices are rising. Nothing is more definitely established than that men do not, as a rule, use the earnings or profits of good times to pay their debts; they use them as the basis of further borrowing, and every crisis and serious depression in the country is traceable to an excessive use of credit.

But what about the future of business? We are not in any danger of a credit crisis; we are too near to the last one; too many people have not forgotten the burns they got then. The major crises come about twenty years apart, which gives an opportunity for a new generation to come on the boards and get its experience.

Spirit of Caution Prevails

We had some of the symptoms of a boom last spring. There was a revival of confidence and a revival of business upon a scale that started prices upward. The fact that prices were stronger stimulated the buying, as it always does, and along with increasing industrial activity came a rise of industrial costs, which was quickly recognized as an unfavorable development. The spirit of caution was aroused and has dominated the situation ever since. It is in the air today and, on the whole, it is an encouraging rather than a discouraging sign. The danger we have to fear will come from over-confidence, with an undue expansion of credit and rising industrial costs. We have neither a state of over-confidence nor of over-expansion of credit; the credit situation is sound; there is none of the pressure for liquidation and few of the uncertainties that characterized the situation two years ago. We have had a year of internal industrial activity with very little speculation, which gives a situation inherently sound. It would not be strange if we had some relaxation of activity, and it would be all to the good for everybody if we could have some reduction of industrial costs. There is nothing in the situation to indicate any serious depression—certainly nothing like the conditions of 1921.

On the other hand, the experiences through which we have passed and the revival which we have enjoyed should give us greater confidence than ever in the inherent strength of this country, and in its ability to maintain under any conditions that may arise at least a fair degree of prosperity. The fact is that more than one-half of all the business in the world is done within the boundaries of the United States. Moreover, our industries and our resources are so varied that they create a great system of exchanges within ourselves with almost unlimited possibilities of development.

The European situation in some respects is still critical, though on the whole improving; but I believe that in any event we have seen the worst of the after-war effects upon this country.

Trade tends to adapt itself to every condition, and it tends to cut the disturbed countries out of the circle of exchanges. We are having more trade with the countries outside of Europe. In 1913 the share of the United States in all the importations of Latin-America was 25 per cent, and in 1921, the latest year for which all the statistics of those countries are available, our share was 45 per cent. In the first eight months of 1923 our exports to Latin-America increased 33 per cent, and it has been the same with our trade with Asia and other regions outside of Europe.

It is true that we still look to Europe for a market for farm products, but on the most of them the margin of surplus is not large, and the needs of Europe are so great that it will put forth its utmost efforts to take them. The population of this country is 15,000,000 greater than when the great war began, and with the trend of population to industrial towns—a perfectly normal movement under present conditions—the unbalanced relation between agriculture and the other industries is in the way of being corrected. In the history of this country we have never had but five corn crops rising above 3,000,000,000 bushels, and today approximately a 3,000,000,000 crop in price corn is hovering around the dollar mark in Chicago.

New Records Set in Production

The recuperation powers of this country are very great. The natural growth of population and the natural inclination of our people to go forward are the dominant factors in the situation. It was commonly thought, at the end of the war, that in some lines of production, and particularly iron and steel, our capacity had been over-developed for many years to come; but the iron and steel industry has been operating this year practically at capacity. In nearly all the principal lines our production this year has been making new records.

That Europe will eventually recover there is no reason to doubt; that Russia in time will resume her position in world trade cannot reasonably be doubted. As these recoveries take place there will be reactions upon business in the United States. The increased production of these countries will make them competitors, but on the other hand as their productions increase their buying power will increase, and they will consume more as well as sell more. There will be more competition and at the same time more trade to be had. On the whole we should not suffer by this increase in the total volume of trade. It is a great mistake to think that one country must suffer because other countries are prosperous; the purchasing power of every country is in its own powers of production, and it follows that the greatest prosperity for every country is in connection with the prosperity of all other countries.

In one respect our position in international trade is different from what it was before the war. Then we were a debtor country and had to have a surplus of exports over imports in order to pay the interest on our debts. Now we are a creditor country, and if we are ever going to collect the interest and principal owing to us, we must have a surplus of imports over exports. The trouble in the settlement of the reparations in Europe grew largely out of the fact that few people are able to understand that the payment of great sums from one country to another cannot be made in money; they must be made in commodities or service of some kind. In that respect we are in the same position in attempting to make collections on the indebtedness of foreign governments to the government of the United States that France and her allies are in trying to collect reparations of Germany. If we refuse to allow payments to be made in goods, while insisting upon payments, the very efforts of foreign governments to exchange in the markets of the world will keep exchange on the United States at a premium everywhere and make it more difficult to sell American goods in every foreign market.

As the world comes back to normal conditions we must expect to readjust our relations to it. We cannot expect to have steady prosperity with a level of prices and industrial costs above the level of the rest of the world. That is only an extension of the proposition that in order to have permanent prosperity we must have balanced relations between all branches of industry at home.

There, at last, is the crux of the question whether we are going to have permanent prosperity or not. It depends upon

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harmonious relations throughout our industry system. The worst enemy of any people, the worst enemy of modern society is the man who is always laying emphasis upon conflicting interests, as though it were by conflict instead of by co-operation that prosperity is achieved. The real basis of all advancement is the harmony of interests. The modern industrial system is essentially co-operative. We have all become specialists, doing one thing and depending upon supplying our own wants by exchanging products or services with others. It is a wonderfully effective organization when all is in balance and running smoothly, but it is much like a machine in which every part is dependent upon every other part.

Railroads Borrowing Too Much Money

One of the most vital factors in the business situation today is the transportation system. The railroads are needing great sums of money to equip them to take care of the increasing business of the country, and they are spending great sums, but it is a bad sign that they are raising them almost entirely by borrowing.

Now, that is not a sound or permanent method of raising capital for the railroads. In all sound financing there must be a proper margin of proprietors' capital to protect borrowed capital. That margin is now furnished by past investments, but it is being steadily diminished by new borrowings, and that system of raising capital cannot go on indefinitely.

The situation is best described by taking a few examples. The Chicago, Milwaukee & St. Paul system is one of the great systems of the country, serving many communities in the middle west and northwest. That company has about $116,000,000 of preferred stock outstanding, all of which was sold to the public a good many years ago at $100 per share, and the treasury of the company received the money. The last dividend on that stock was paid in 1917, six years ago, and if you would like to own some of that stock you can buy it on the public market tomorrow at about $27 per share.

The same company has outstanding about the same amount of common stock. Now, it is often said by the critics of railroad management that the common stocks do not represent any actual investment of capital; that the common stock is water. It is true that in the construction of some of the roads common stock in some instances was given as a bonus to promoters and to the buyers of bonds. I don't know the history of the early issues of the common stock of this company, but I do know that 70 per cent of all the common stock now outstanding has been issued since 1900 and sold to the public for $100 per share for the benefit of the company's treasury. That stock has had no dividends since 1917, and had paid only 4 per cent for several years before that, and if you want any of it you can borrow it on the market at about $15 per share.

You can buy the 4½ per cent refunding bonds of this company, secured by mortgage, for a little over one-half their face value.

The Baltimore & Ohio is one of the oldest railroads of this country. Its lines are in old and densely populated and highly industrialized sections of the country. The Baltimore & Ohio company was reorganized in 1900 with $25,000,000 of common stock, some of which represented preferred stock in the old company. It now has $152,000,000 of common stock outstanding, and besides that $25,000,000 has been sold for cash at $100 per share. No dividends have been paid on that stock in the last four and one-half years, and for several years' suspension the rate was only 4 per cent. Four years ago the company wished to raise $10,000,000 for betterments, and in order to raise it, it was obliged to agree to invest $17,500,000 in additional betterments from earnings in order to increase the margin of safety for the borrowed money. In order to do that the company was obliged to suspend dividends on its common stock. That stock has sold as low as $30 per share in the last four years. The board of directors has lately undertaken the resumption of dividends at the rate of 5 per cent, and on the strength of that announcement the stock has sold at $59 per share, and you can get some at that price, or possibly under, if you want it.

Now, this is the position of two of the leading railroad companies of the country? Of course neither of them is in position to raise new capital by selling its stock, and if you will go down the list of railroad companies you will find that the number whose stocks are selling at par or better is very small.

Now, this question does not especially concern the bankers; they are not the owners of railroad stock. It does not especially concern Wall Street. Wall Street is a market place, but it does not own these stocks. There are over 700,000 holders of railroad stocks in the country, but they are not the people chiefly concerned: The matter of chief concern is transportation service, and that involves the whole prosperity of the country.

There are other matters that are closely related to the prospects for prosperity. There are questions of taxation and of government control over business. There is the soldiers' bonus measure pending, which is estimated to call for approximately $4,000,000,000.

The late President Harding, whom no one ever accused of being wanting in sympathy for the soldiers, declined to sign a bonus measure, because it was not accompanied by provision for the means of payment, which would seem to a business man to be a proper position. If such a sum is to be raised by the sale of government bonds, all outstanding government bonds and other securities as well will be unfavorably affected, and the influence will extend throughout the money market, touching also the supply for business purposes.

If the funds are to be raised by restoring the excess profits taxes, or by increasing taxation upon a few, the supply of capital for the extension of business will be affected. In other words, you can't use the same capital for two purposes at the same time. If it is to be taken and scattered in the payment of the bonus, it must be diverted from other purposes; or if the attempt is made to raise the money by pure inflation, as we raised the money for the war expenses, we must expect the disorganization of our finances and industries which we experienced then. In any event normal conditions will be disturbed to raise such an enormous sum.

These are complex questions for the public to deal with. They have grown out of our complex interdependent system. They are tests of the capacity of the people to live under this highly organized system. The fact is that it takes a higher order of intelligence, a higher standard of citizenship and higher sense of responsibility and of mutual obligation to be a citizen of a modern community than was required in a primitive society when everybody did nearly everything for himself.

There is nothing wrong with fundamental conditions; there is no reason why we should not have prosperity. Is it possible that we have developed an industrial organization which to many is beyond our moral or intellectual capacity? I leave the question to you, for in its solution is the answer to the question, "Are we to have prosperity?"

Business Forecasting with Special Reference to Paper Industry*

By Dr. E. O. MERCHANT

Statistician, Mead Pulp and Paper Co., Dayton, Ohio

I DON'T propose today to recite a lot of figures to you about business conditions, or about the paper industry, although my head may be full of them. What I have in mind to do, rather, is to keep school for a few minutes and see if we can analyze some of these fundamental principles that underlie the trend of business, and thereby get our bearings a little better. There never was a time when it was more important that those in charge of sales, as well as the salesmen themselves, should have accurate information regarding business conditions; the sales executives, in order to avoid the costly mistakes that arise from bad judgment, and the salesmen themselves in order that they may more intelligently assist and advise their customers regarding their purchases. For this reason I have consented to talk to you on the subject of "Business Forecasting." My purpose is not to enter into a detailed forecast of what is going to happen during the next year or two, but rather to analyze business conditions as statisticians are accustomed to do, so that you can learn how to do your own forecasting.

Business Forecasters Hold Different Opinions

As you all are probably aware, this year has been an open season for business forecasters. There never was a time when the experts on business conditions disagreed so widely as they do today. Right now you have forecasts for next year, ranging from a big boom year on the one hand, to a year of severe depression on the other, and these predictions are not coming entirely from amateurs, they are coming from college professors, business services, and men who give a lot of time and study to this thing. For this reason you can see it would be rather rash for me to make positive predictions about what is going to happen. What I intend to do is to analyze the situation for you, pointing out the favorable factors and the unfavorable factors, as they exist today without any coloring, and let you come to your own conclusions.

The first thing I want to talk about especially is the subject of business cycles. On all occasions like this you always find me expounding on the subject. Some of you may think I have wheels in my head, or that business cycle is my middle name, but it is not. This economic phenomenon is something

*Delivered at meeting of the Salesmen's Association of the Paper Industry, Wednesday October 10, 1923, at the Drake Hotel, Chicago.

The Euclid 105th Properties Saved 118 Tons of Coal with a 30% increase in load the first month with one Detroit Single Retort Underfeed Stoker

Mr. S. Cowan of the above company is authority for the following statement:

"We sell steam heat, hot water, electricity, and refrigeration, in the east end territory of Cleveland. We had been operating for 15 years with 3 . . . . . Stokers and had been making approximately 96,000 units per month, until one Detroit Underfeed Stoker was installed in our plant as a test and we found that by the operation of this Detroit Underfeed Stoker that we saved one hundred eighteen tons of coal during our first month of operation. We produced 127,000 units of electricity during that period, an increase of 31,000 units over and above any previous month.

"We were so pleased with this showing that we contracted for the immediate installation of two additional Detroit Underfeed Stokers which are now in and giving entire satisfaction. We have no hesitancy in recommending the Detroit Stoker. We have tested and tried same in every manner possible and we find it absolutely satisfactory."

Experiences such as the above explain the constantly increasing popularity of Detroit Stokers. Ask some of your friends in the Paper Industry, such as the following, what they think of Detroit Underfeeds:

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Fairfield Paper Company
Fort Orange Paper Company
Interlake Pulp & Paper Company
Manistique Pulp & Paper Company
Northwest Paper Company
National Paper Company
Riverside Fibre & Paper Company
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If you want to effect *real* savings in your plant install a REAL Underfeed Stoker—the Detroit.

Ask for Bulletin 242

DETROIT STOKER COMPANY

Underfeed Forced Draft and Overfeed Natural Draft Stokers

242 GENERAL MOTORS BUILDING DETROIT, MICH

DETROIT UNDERFEED TYPE U STOKERS

ASSURE CHEAPER SINGLE RETORT STEAM PRODUCTION

we must all understand, if we are going to interpret correctly what we read in the papers and hear daily about business conditions. There is no way to really get your bearings, to get the proper perspective of economic developments, or to forecast intelligently except by understanding the principles underlying business cycles.

Now the word business cycle does not mean as much as many people attribute to it. About all the word means, is that you will eventually come back to the starting point. We all know—it does not need to be proved—that business fluctuates from prosperity to depression and back to prosperity, so you can start at any point you want and you will eventually get back to it. That is all the word cycle means. It does not mean that these fluctuations or swings of business have any predetermined length or predetermined intensity. If they did, all we statisticians would have to do would be to work out a mathematical formula, and sell it to you for ten dollars a head, and you could do your own forecasting. The result would be that soon there would not be any swings. Everybody would be so well posted, that you couldn't have such a thing.

Four Phases of Business Cycle

To illustrate a few of the things we know about business cycles, I want to call your attention to the chart here. I made it in the form of a circle to illustrate the word cycle, as I have defined it. Every cycle can be said to have four phases. The first phase is one we call depression, the second is revival, the third is prosperity, and the fourth is liquidation. We don't always know exactly where the dividing line is between any two phases, but the earmarks of each are sufficiently clear to enable us to locate ourselves quite closely. An important thing I want to bring to your attention is this: that the business cycle always goes through these phases in this order, and it never goes in any other order. It does not do any cutting across the lot or any reversing of the direction. It goes around continually in this way, so when you are in one of these phases, you know that sooner or later you are going to get into the next one.

Now the reason for this is that there are always forces generated in each one of these phases, which carry us out of that phase and into the next one. When you are in a period of depression, you all know what the characteristics are; you can recall them from 1921. Production is less than consumption because there are big inventories that have to be used up. There is general unemployment. Sometimes if the depressions are severe we have bread lines. There is an accumulation of funds, which causes money rates to decline, and when money rates decline long enough you are bound to get a rise in bond prices. These are all characteristics of the period of depression.

Now, then, after consumption has used up all of the stocks that have been accumulated in a period of prosperity, new buying starts, and as the new buying gets under way, plants open up, employment increases, more men go to work and spend their warges for more goods, etc. In this way the revival gains momentum.

There are usually two forces, either working singly or together, that help to swing us out of a period of depression into a period of revival. One is favorable agricultural conditions which increases the buying power of the big farming population. As soon as the farmers get their money from the harvests they start buying and that stimulates the revival. The other force is new building, large expenditures for new building. In the last period of depression it was new building, the building boom, that pulled us out of the depression and not the agricultural situation, for that was unfavorable. It did not help as much, if at all, but the building boom did. That was the main economic force that brought us out of the depression of 1921 into the period of revival in which we were traveling during the year 1922. It was supplemented by a heavy demand for automobiles and also a heavy demand for railroad equipment. During that period of revival we had general expansion of business activity, rising prices, rising costs, rising money rates, and also rising stock prices, etc. We got up sufficient momentum in the period of revival to go on into the period of prosperity, and we have been in this period of prosperity during the present year, 1923.

What are some of the characteristics of a period of prosperity? You all know them. They were present in exaggerated form in the boom of 1919 and 1920. Production exceeds consumption, causing an accumulation of stocks. You have rising wages, rising costs and rising prices; you have inefficiency of labor and also inefficiency of management. You have rising money rates which causes security prices to go down. You have also a wave of optimism. Everybody thinks the prosperity period will last forever, and goes ahead expanding on that basis. You have as a result an over expanded plant capacity. Eventually these unfavorable factors or disease germs, if you want to call them this, get strong enough to overcome the favorable factors and force us into a period of liquidation.

Late last fall and the first part of this year when we were entering the period of prosperity, everything was going according to Hoyle and the work of the statistician was easy. We had expanding business activity, rising prices, money rates went up somewhat, and looked as if we were going right on through the period of regular fashion. Then about the end of March something happened. We got off the beaten path before we realized it and since then nobody has been able to forecast with any great degree of certainty what is going to happen.

I want to add at this point that there are times, and this is one of them apparently, when enough unusual influences can develop to confuse the situation and when that happens it is very difficult for any one to forecast with absolute accuracy. That is what has been the situation since the last of March, and that is the reason why the business services and economists are so far apart in their views. They have no guideposts to steer by.

Why Prophesies Disagree

Now, what were the forces that brought about the unusal situation? Well, I think the most important one was the invasion of the Ruhr District of Germany, by France. As long as Europe was producing, buying and selling goods, even with conditions as bad as they were, she didn't have much of a retarding effect on our own prosperity, but when France invaded the Ruhr and the Germans retaliated with passive resistance, the production of sixty-five million people was soon curtailed and when you curtail production you curtail buying power. People can't buy unless they can sell and so a great market for the world's commodities was restricted. It was not long after that happened until there was a business reaction, and declining commodity prices, not only in this country, but in England and other countries. That was one of the unexpected forces that came into the situation and that is one of the factors that I think every man who is trying to look ahead and forecast correctly, must watch very closely from now on.

The Germans have given up passive resistance as a government policy, unconditionally, but of course the damage cannot be immediately repaired. A good many of the skilled workmen and also the managing ability that operated the Ruhr factories are either in jail or have left the district, and it is going to take some time to build up the industrial organization again, get the factories running, get the people working, and restore the buying power of that district.

The German government is gradually weakening under these unusual and unsettled conditions, and the Reds on the one hand and the Monarchists on the other are exerting every influence they can to get control of the government. What is going to be the outcome nobody knows. The German government may collapse perhaps; or in a short time there may be a settlement of this whole situation. If this happens, then we are going to see increased buying of our commodities again by Europe, and this is going to be a stimulating factor, in the business situation. So all we can do, gentlemen, regarding this factor, is simply to watch the news closely. Don't be misled by the headlines but try to get the real facts on the situation.

Now, the second factor that came into this period of prosperity and helped to cause the reaction, I think, was the propaganda against inflation which was circulated last Spring. We have enormous gold reserves as a result of heavy importations during the past two years. These gold reserves of the Federal Reserve System can be multiplied at least ten times in the expansion of credit, if necessary. Because of this fact some people feared that we were running into a period of inflation last spring. They got scared, and started the propaganda which was widely circulated, to head off inflation. It immediately reversed business sentiment which up to this time was growing optimistic. Business sentiment changed over night and became pessimistic, a very unusual occurrence in a period of prosperity. You don't often see such a thing happen. Now, of course, there can be an honest difference of opinion, but I am inclined to think that those men who started the propaganda were unduly alarmed. I think that it did more harm than good, but unquestionably it did some good. During the last quarter of 1922 and the first quarter of 1923 there was some over-production. Wages, costs and prices went up too fast in some cases. There was some accumulation of inventories. When the situation changed and we entered the period of business reaction, production was curtailed and stocks were reduced. We got ourselves in a few months on a much sounder basis than existed at the end of March.

After every severe business depression such as we had in 1920 and 1921, business sentiment is especially sensitive to

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bearish suggestions and therefore it is unwise in my opinion to circulate suggestions of this kind.

I can further illustrate the course of business during recent years by reference to the Harvard Index Chart, the Brookmire Forecasting Chart, and the Price Index Chart. The black line on the Harvard chart represents general business. It went back in the boom period of 1919 and 1920, and quickly came down in 1920 and part of 1921. During the rest of 1921, the curve was running along in the depression period. In 1922 it started to climb upward into the period of revival and then on up into the period of prosperity until the reaction occurred last spring. Then the curve turned downward for a few months. The bottom was reached in July and in August the business curve started up again.

MR. GIBSON: What is the date of the upturn of the business curve?

DR. MERCHANT: That is the month of August.

MR.GIBSON: Is that the low point?

DR. MERCHANT: The low point was July. I haven't the September figures yet. I think they will show that the trend is well held if not still upward.

There are some other evidences that this business reaction came to an end in July, and since then business has been on the up-grade again. I call your attention to the index chart of commodity prices including Dun's, Bradstreet's, U. S. Bureau of Labor statistics and Prof. Fisher's weekly index. You will notice what happened to those curves. All the curves went down together in the spring of 1923, but in August and September they turned upward again, indicating that the reaction was over.

The Brookmire forecasting chart also illustrates what has happened this year. The theory of this chart is that the forecasting line should turn about one month ahead of the speculative stock line and seven months ahead of Bradstreets's commodity price line. As an evidence of the fact that conditions were all upset this year, the speculative line actually turned down before the forecasting line did, and the commodity price line turned about as quickly. The forecasting line went down a little but would not stay down. After two or three months it turned up again.

Consequently the Brookmire service is the most optimistic of all the business services today. These people say that this revival of business is going to continue for some time, perhaps well over into 1924. They are quite confident that their forecasting line is supporting this prediction.

Now, let us take a look at the fundamentals of business and see where we stand. Consumption is running on a very high level today. It has been on a high level during the whole year. As positive evidence of this fact look at the weekly freight car-loadings, which show the volume of goods moving through the channels of distribution to the ultimate consumer.

I didn't have imagination enough when this chart was drawn for the line of total car-loadings is already off the chart. This middle line on the chart is one you will all be interested in for it represents the miscellaneous, L. C. L. and package freight car-loadings. In this group is included all those goods that are carried in packages, cartons, containers and wrapping paper and you see that this line is still going up.

Another evidence of the high level of consumption is furnished by the figures on retail sales published by some of the Federal Reserve Banks. The figures for cities like New York and Chicago show that the volume of retail sales is keeping up; it is breaking all previous records. That is natural, for everywhere everybody is well employed and getting good wages and if you will compare the wages paid today with the cost of living you will find that the workers have a bigger margin of buying power than they had in 1920 when prices went up as fast or faster than wages. This year prices are being kept down while wages have gone up, and the margin of buying power has been increased.

MR. GIBSON: Before you get off the subject of car-loadings, how many weeks has it been since the car-loadings have run over a million cars a week?

DR. MERCHANT: The million car-loadings started in the last part of May and have continued to run over a million cars a week except for three or four weeks where there were holidays like the Fourth of July and Labor Day, and the week the late President Harding died, and one other, I think. The high point last month was about a million and ninety thousand. Now, the high point last year was about a million and fourteen thousand, I think, and in 1920 it was a million and eighteen thousand. Anyway, we are considerably above the previous high records.

Inventories Are Not Large

The second fundamental factor is that inventories are not unduly large. During the last quarter of 1922 and the first quarter of 1923 there was a tendency to expand inventories. The business reaction we have had since then has caused the liquidation of these inventories, so that today, generally speaking, they are smaller than they were on April first and are generally on a sound basis. Here and there you will still find inventories that are too large. That is true of pig iron, for instance. But generally speaking, inventories today are on a sound basis. In other words, there is not a large stock of finished goods to be worked off which would cause a curtailment of production.

The third fundamental factor is that we have a sufficient labor supply to take care of production and the fourth is that we have adequate transportation facilities. You don't realize perhaps how well the railroads are taking care of the enormous volume of traffic today. There is practically no car shortage anywhere. If you go back over the history of this country you never will find an instance where we were in a period of prosperity with so little car shortage as we have today.

The fifth fundamental factor is the money situation. Ordinarily by the time we get into a period of prosperity, money rates have climbed up quite a ways, but on account of the fact that we have had a billion and half or two billion of gold injected into our Federal Reserve System during the past two or three years, we have a money situation today which is like the situation we usually have back in the beginning of a period of revival. I don't know of an instance in the history of this country where we have had money conditions like they are today. It is an extremely favorable factor in the present situation. These are some of the fundamental factors which every economist, statistician and business service, watches closely and it is for the reason that these factors are all so favorable that services like the Harvard and Brookmire and Professors like Fisher of Yale and bank presidents like Reynolds of Chicago say that there is no possibility of any severe depression taking place next year, but on the contrary business is likely to remain good.

Unfavorable Factors

Now, there are some unfavorable factors in the present situation and in my position it would not do to neglect to mention them also. One unfavorable factor is the Ruhr situation which I have already described. Another unfavorable factor is the bearish business sentiment that prevails. This year more than ever before it has been a question of psychology. Take the groundwood pulp market as an illustration. The statistics show that we have had smaller stocks of groundwood pulp on hand during this year than ever before, and yet the price of groundwood has not risen above fifty dollars at the mill, whereas in 1920 with stocks considerably larger than this year the price sailed up to one hundred and fifty dollars a ton at the mill without any difficulty at all.

Sugar is another illustration. There is barely enough in existence to get us by until the next crop, but the speculators could not get the price up over ten cents before the public rose up and said, "We are being gouged and we won't stand for it." And the price went down. In 1920 with more sugar available the price soared above 30 cents. It is necessary to give business sentiment more than usual consideration at this time. When business sentiment is bearish as it is now, business men will not use this big fund of available credit to expand their business. They are afraid to. Business men will not go ahead and buy for the future; they will only buy from hand to mouth.

Another unfavorable factor is the surplus plant capacity. You all know that following the boom of 1919 and '20 plant capacity was very rapidly expanded in almost all lines of business, and today we are still paying through the nose for these foolish excesses. This surplus plant capacity along with this bearish business sentiment makes it very difficult for manufacturers to get their prices up in line with their costs, consequently you will find all through industry today concerns doing a record volume of business, with nothing to show for it. That is the reason why since last March we have had a bear market in industrial securities. Manufacturing concerns are not making the profit they ought to be making on their volume of business. Competition is too keen on the one hand to allow them to raise their prices, and the sentiment of their customers is too bearish on the other hand to permit them to raise their prices.

Then along with the surplus plant capacity we have had a smaller export market this year. If we had had a big export market we could have disposed of most of our surplus and run our plants to capacity, but that was impossible with small exports. On the other hand, imports have been large. We have been getting some heavy importations of commodities into this country in spite of the tariff barriers and these are competing with the product of domestic manufacturers. If

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this goes far enough it will cause some of our industrial concerns to shut down, throwing their men out of work.

Some people regard the coming presidential election as an unfavorable factor because of the radicalism that is rampant among the farmers. So those services like Babson, that are bearish on business have some basis as you can see, for their position. I have tried to set forth both sides for you, so that you can see what the picture is. The present situation is not a one-sided one; it is a two-sided proposition with both sides fighting for supremacy. This spring for the time being the unfavorable factors had the upper hand, but since July the favorable factors seem to have regained their former position and we are once more going in the right direction.

The paper industry is a cyclical industry. That is it fluctuates about in line with general business. When times are prosperous the paper industry is prosperous; when times are bad the paper industry is bad, correspondingly.

I know that I don't need to prove that point to you, but I have made a chart showing the production of the four largest grades of paper, newsprint, book, wrapping and paper board in comparison with the Harvard business curve. These production figures corrected for seasonal variation, fluctuate about in line with the Harvard curve. Whatever the Harvard line does these production curves do also. Since the paper industry is a cyclical industry we get the same tendencies that we do in general business; in other words, in a period of prosperity production exceeds consumption and stocks are built up and in a period of depression consumption exceeds production, while the stocks are being used up. To illustrate that point I have placed on the chart a line for newsprint consumption to compare with the curve for production. During the year 1920 the production line was above the consumption line and stocks were built up. In 1921 the position of the two lines was reversed, while the stocks were used up during 1922 and 1923 both lines clim upward together showing a healthy condition. The same thing would undoubtedly be true of all the branches of the paper industry if we had the figures to show it. I think it is probably true also that greater variation between production and actual consumption exists in the case of those grades of paper distributed through jobbers than in the case of the grades of paper distributed directly, for the jobbers constitute an intermediate reservoir of stocks which expands and contracts according to changes in conditions. When the jobber starts to liquidate his stocks he stops buying entirely for the time being. That throws your production way down while your consumption is going along at a steady pace.

If we trace the history of the paper industry through the past few years, I think that perhaps it may help us to see what we can do as an association of salesmen to help stabilize condtions. You all know what happened in the paper industry in 1920. Buyers were out after paper and were willing to pay any price for it. The demand was tremendous. It looked like the mills couldn't take care of it. The salemen were as badly deceived by appearances as their executives. They thought they had the world by the tail, selling was pretty easy. When the smoke cleared away it was found that everybody was stocked up with paper; the mills were stocked with raw materials and new plants were being built everwhere. When we came into this period of liquidation and depression these stocks had to be used up and while they were being used up production was less than consumption. During the year 1921, a salesman couldn't sell a customer a week's supply of paper to save his neck. But after we entered the period of revival, buying picked up again and during the last quarter of 1922 and the first of 1923, business was generally pretty good in the paper industry; production was expanded, buying was active, and I think if we had all the facts to show it some over-production and some increase in inventories took place. Then when the sudden reaction came and business sentiment was reversed, those inventories were reduced and while that was going on the orders necessarily were few and far between. Consequently in some branches of the paper industry conditions were quite dull this summer.

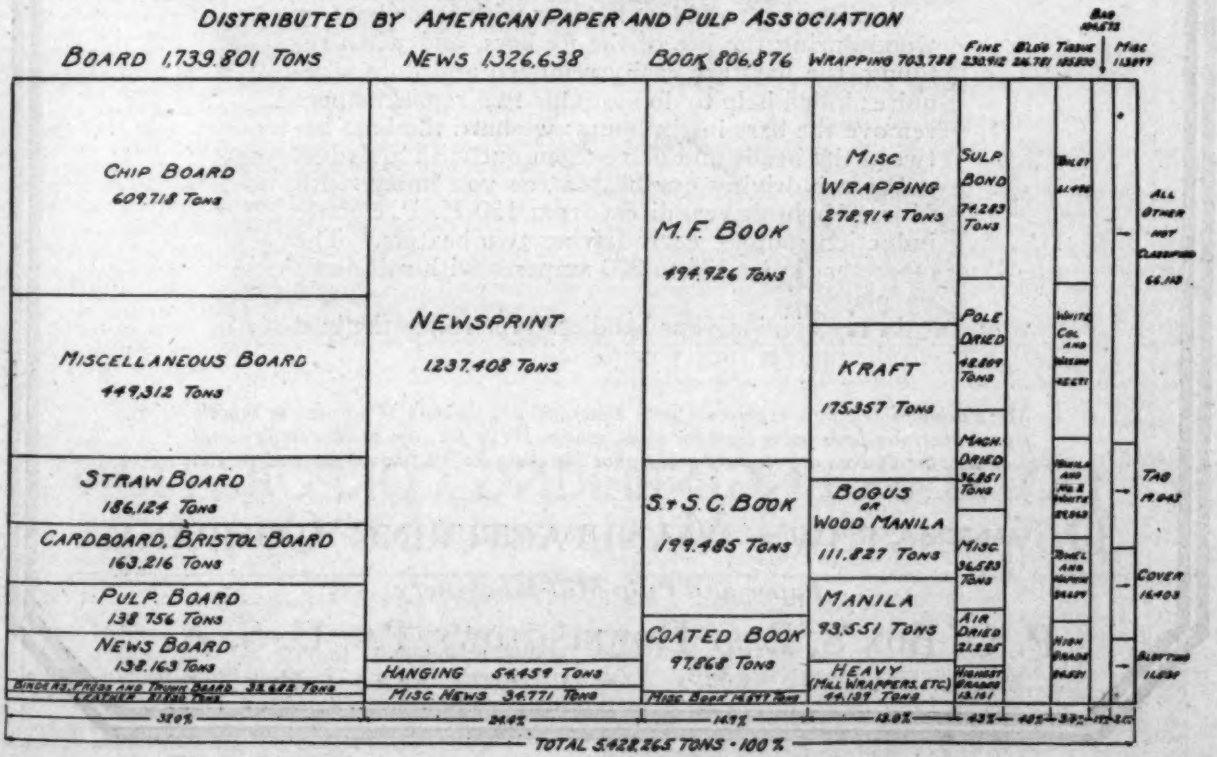
The paper industry today like business in general is still paying for the unnecessary expansion of plant capacity following the boom of 1919 and 1920. It is also experiencing increasing imports and decreasing exports in some grades.

If, as now appears quite certain, general business is on the up-grade again, we can all be sure that the paper industry will go along with the rest of the procession. If we have better business this fall and winter generally, the paper industry is going to share in it. So to bring this talk to a conclusion, the message I want to leave with you is that if you gentlemen in this association will go to your customers and tell them that conditions are essentially sound, and that there is no reason for all this timidity and apprehension, you can help turn the wheel in the right direction. Let us put our shoulders to the wheel and PUSH it over.

PRODUCTION OF PAPER IN UNITED STATES IN YEAR 1921

SOURCE U.S CENSUS OF MANUFACTURES - 1921

DISTRIBUTED BY AMERICAN PAPER AND PULP ASSOCIATION



Figures for 1921 are given as these are the Latest Complete Governmental Statistics.

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We are making 60 tons per day with six of your beaters, which is 10 tons per 24 hours for one beater.

We filled the rolls in the summer of 1919 and have been running them continually night and day since, without spending a cent on repairs. The bars in the rolls look as if we will get another year's service out of them. This, you will agree with me, is quite a record for a felt mill.

We have no trouble whatever with loose bars or wood during the life of the fly bars, and when refilling, the bars are easily removed and do not require skilled help to do so. Our two repair helpers remove the bars in six hours; we burn the bars between the heads and drive them out with a sledge.

We are driving our beaters, as you know, with Morse chain drives, direct from 150 H. P. electric induction motors, each driving two beaters. The ammeter shows 175 to 200 amperes with roll down on plate.

In my opinion your bandless type roll is the best on the market for a roofing mill."

Mr. Furlong's felt mill experience with Downingtown Beaters is similar to reports from superintendents using them for other grades. Write for our beater catalog—and read how the fly bars are securely held in our Bandless Rolls without keys, wedges, etc.

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Situation as Seen by the Merchants*

By J. A. CARPENTER

Kansas City Paper House

WHEN Mr. Lloyd George arrived in New York last week, he said in practically these words, "This is certainly God's country."

When I look around at the evidences of prosperity of the gentlemen sitting in front of me, this goes through my mind, —is this prosperity that I see the results of 1918 and 1920, or is it the results of the business of 1923? How much of this prosperity was made on paper and how much of it is money in the bank?

There are three clases of people in business in the paper line of both manufacturers and merchants: First, those who are handling their business in a promiscuous fashion, meeting and cutting prices of all their competitors, not knowing where they are going and where they will end; Second, those who have a semi-cost system, a semi-business policy, but that take a lot of business, which they know in the bottom of their hearts they are not getting any money on; Third, the man who knows his cost, has a fixed price, a fixed quality of merchandise and a line of customers who want this class of business. Which class are we in, each one of us?

The paper business as I see it today is in a good deal the same condition as almost every other business. Very few of either manufacturers or merchants are making very much money. The executives get a monthly sheet showing the amount of business done, and they are rather pleased at the amount of sales. They next look at the profit column and their faces drop. Then they look at the cost of doing business and they are very much surprised, although they saw practically the same figures last month.

What are we going to do to remedy this? My idea is that the one solution is more such meetings as we are having today. Get closer together; know each other's troubles; strive to work them out in a way that will be a help to both the manufacturer and the merchant.

The situation in the East so far this year seems to have been very much more advantageous than it has been in this territory. Labor is practically all employed at high wages. The demand for a better class of goods has been fair and money has seemed to be fairly plentiful. This condition has not prevailed in the Central West for several reasons.

The Far West, I think, has fared better than the East or Central West. As I understand it, statistics show that there are 5,000 people landing in California every morning, and, supposing every one of these people carry only $100.00 with them to spend, it means a half million dollars a day. Is it any wonder that they can sell Butchers' Manila at 8c per pound, Hammermill Bond at 18c per pound, and Strathmore Parchment in the same proportion? We would all be inclined to think this would be a wonderful place to be, but I understand that they have their troubles as well as we do in our localities. So let's see if we cannot work closer together, the merchant and the manufacturer, whereby we will both receive a reasonable return on our investment and a reasonable compensation for the labor put into the paper business.

Questionnaire Sent to Merchants

I think you would all be interested in hearing the results of a questionnaire sent out to 100 representative merchants of practically all sections of the United States. These answers give you a birds-eye view of the conditions of the paper merchant in reference to stock on hand, his ideas as to future market conditions, and the outlook for business in his particular territory. First, I will read the questions and then the answers:

1. Have you placed your orders with the mills covering your requirements for the next: (a) 30 days; (b) 60 days; (c) 90 days? Out of the answers that came in 35 were in the (a) class, 48 in (b), and 16 in (c). One answered this question by saying "No."

2. How are your stocks as of October 1, in relation to last year of the same date: Larger; Smaller; About the same? On this question 33 stated their stocks to be Larger, 16 Smaller, and 51 About the same.

3. What is the outlook in your territory for the paper business this fall: Fair; Very good; Bad? Seventy-eight replied Fair, 21 Very good, and 1 Bad.

4. What are your ideas as to the paper market for the fall months: Declining; Firm; Advancing? To this 30 replied Declining, 68 Firm, and 2 Advancing.

It has been brought to the attention of the merchants by the cost department of the National Paper Trade Association, and this applies from coast to coast, that 35 percent of the orders received every day are for $5.00 or less, and 60 percent of the orders that are received every day are for $10.00 or less. The former cannot begin to pay the expenses of handling and the latter will just about break even. When you understand the expense of doing this part of the business, which is, of course, all done out of the warehouse, which represents at least 80 percent of our capital investment, you can readily understand that this is a serious situation.

These are some of the things that make it very essential that the National Association of both manufacturers and merchants work closer together than ever before, particularly for the reason that there does not seem to be much opportunity of reducing the expense of doing business. As we know each other's business better, we can work in more perfect harmony. In fact, that is the very object of having meetings like this one today. None of us want to go on record as going backward, so let's push ahead for better things in the future.

I would like to present you briefly some of the difficulties that confront the paper merchant today, and I know our members present will be pleased to hear any suggestions from the manufacturers as to how these difficulties may be overcome.

One of the problems confronting the wrapping paper merchant is—How are we going to take care of the 250 tons of Kraft that is coming in on us from the new mills that are just starting? Another problem is—How can certain manufacturers reconcile themselves to the policy of certain mills which are carrying warehouse stocks in various distributing centers? Is this not a direct usurping of the legitimate functions of the paper merchant?

Let me point out clearly that we have no quarrel with any particular mill whose policy is to sell direct to the consuming trade, but only with those who are supposed to distribute their product through the legitimate paper merchant. These are some of the things that the merchants meet today, that makes us wonder who our friends are and who we should give our carload orders to.

With the improved condition of the farmer, which has occurred in the past two weeks, makes it look as though they were very much better off than they thought they were. As I understand, they will receive about 22 percent more for 1923 crops than in 1922. This being the case, why should not the paper manufacturers and merchants have a very much better year than 1922?

We would also all be interested in hearing the latest developments regarding the possibility of embargo on the importation of wood pulp from Canada.

*Address before Joint Session of the American Paper and Pulp Association and National Paper Trade Association, Thursday, October 11, 1923, at the Drake Hotel, Chicago.

Preparation of Bleaching Liquors from Liquid Chlorine*

By JAMES H. MacMAHON

Technical Representative, The Mathieson Alkali Works, (Inc.) Niagara Falls, N. Y.

TOWARDS the latter part of last year, I read a paper on the preparation of bleach liquor from Liquid Chlorine by the Mathieson System before the Michigan Division of the Superintendents Association at Kalamazoo, Mich.

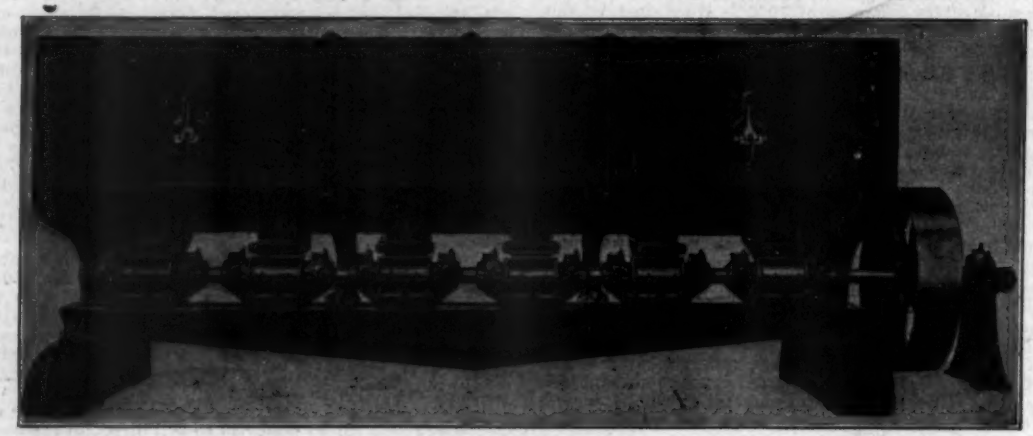
Since that time several installations have been made and we have had a more extended experience with the practical operation of the system. The paper I am reading today is substantially the same as was presented before the Superintendents meeting, but as probably many of you may not be conversant with the system and others who are familiar with it interested in asking questions at the close of the paper with regard to any particular point which is not clear to them, we feel that to present this opportunity warrants a second reading of the paper.

Liquid chlorine is unquestionably now firmly established in the pulp and paper industry with every indication of rapidly supplanting bleaching powder in this industry. With this prospect in view a method which simplifies the operation and offers economics in the preparation of bleach liquors must be of interest to all engaged in bleaching operations.

Chlorine is a greenish yellow gas with a pungent odor. Under a pressure of six atmospheres at 32°F., it forms a clear amber colored liquid at a specific gravity of 1.44. The pressure varies with the temperature, ranging from a pressure of about 15 lbs. per square inch at 0°F. to 150 lbs. at 100°F. Liquid chlorine is shipped in steel drums which contain 2,000 lbs. of chlorine and in tank cars holding 30,000

*Paper read before the Tappi meeting, held in conjunction with the National Exposition of Chemical Industries, Grand Central Palace, New York City, September 20, 1923.

Pulp and Paper Mill Machinery



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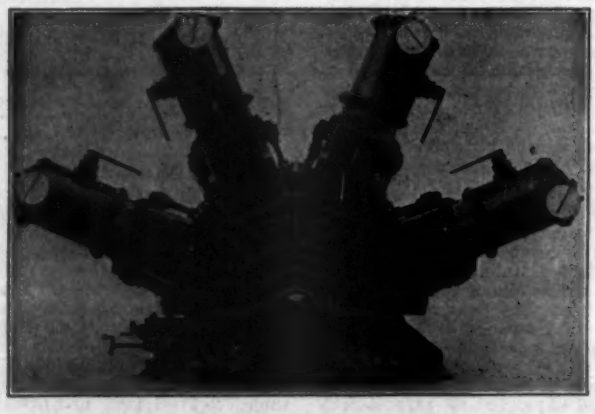

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lbs. It is also shipped in steel cylinders of two sizes, the smaller containing 100 lbs. and the larger 150 lbs. of chlorine. The small cylinders are more generally used where the consumption does not exceed two or three hundred pounds per day.

In the preparation of bleach liquors from liquid chlorine, a lime or soda base may be used to combine with the chlorine, calcium or sodium hypochlorite the bleaching agent being produced. It is essential that certain conditions be strictly observed if efficient and economical results are to be obtained. The liquid chlorine must be first vaporized into a gas before being absorbed by the base to guard against the possibility of local supersaturation of the solution with a resultant loss of the available chlorine.

The reaction of the chlorine with the base produces heat which raises the temperature of the solution, the degree of temperature attained being in direct proportion to the amount of chlorine absorbed. Should a temperature of approximately 40°C. be reached, decomposition of the hypochlorite begins, chlorates being formed which increase rapidly as the temperature rises. To avoid losses from this source and maintain the full bleaching strength of the solution, it is important that the temperature of the solution be kept within this limit. It is also of importance that overchlorinating or passing chlorine into the solution in excess of the amount required to combine with the base be avoided. By so doing an acid condition of the solution is produced, its stability affected and a rapid decomposition of the hypochlorite takes place.

The Mathieson system meets these conditions in an exceedingly simple and practical manner. The liquid chlorine is vaporized in a coil which is placed in the tank in which the bleach liquor is prepared and immersed in the liquor. In ths way advantage is taken of the cooling effect of the latent heat of vaporization of the liquid chlorine to counteract the heat of reaction of the chlorine with the base and thus keep the temperature of the liquor within the limit at which decomposition of the hypochlorite takes place. The coil serves a two-fold purpose: it functions as a vaporizer for the liquid chlorine and as a cooler for controlling the temperature of the bleach liquor during its preparation.

By using a tank of sufficient capacity, in preparing the bleach liquor, to hold the required volume of milk of lime or other alkaline solution, containing sufficient lime or other alkali to combine with the full weight of chlorine in the container, over-chlorination of the liquor is avoided, and by maintaining the same volume of alkaline solution with the same weight of chlorine for each successive batch, bleach liquor of absolutely uniform strength is ensured.

Having outlined the principles of the Mathieson system, we will now consider their practical application, particularly in the pulp and paper industry. (Figure 1.)

The drawing shows a tank in which the bleach liquor is prepared. It is of concrete construction 12 feet diam. by 12 feet deep. It is equipped with an expansion coil of a 2 inch extra heavy lead pipe which is connected at one end to the liquid chlorine supply pipe, the other end which is reduced to 1 inch terminates in the suction line of the pump. The centrifugal pump is of standard design and has a capacity of about 500 gallons per minute. The connection on the suction side of the pump are 5 inch pipe and the discharge line which is 4 inch pipe enters the tank about 4 feet from the top and placed tangential to it. The 5 inch drop syphon is connected to the suction line of the pump with valves and fittings as shown. The liquid chlorine supply line is 1 inch extra heavy iron pipe connected at one end to the container by a flexible copper tube. The other end, which is connected to the expansion coil, is fitted with a pressure gauge and expansion valve.

In the preparation of the bleach liquor, a high calcium lime is used to absorb the chlorine, and either quicklime or hydrated lime may be employed. While quicklime is probably less expensive, hydrated lime is generally preferred as it can be more conveniently handled and the necessity for slacking and cooling the quickline is dispensed with.

In operating, the tank is filled with water to within a few inches of the top, centrifugal pump started and required amount of lime added. Where quicklime is used about 1 lb. per 1 lb. of chlorine will be required, with hydrated lime from 1.15 lbs. to 1.2 lbs., depending on the quality of the lime. A container holding 2,000 lbs. of liquid chlorine is connected to the pipe leading to the expansion coil. The container is provided with two eduction pipes which project radially from the center of the container in opposite directions so that chlorine either in the gaseous or liquid form can be withdrawn. With the valves in a vertical line and the connection made to the lower valve, liquid chlorine is withdrawn and the container can be completely emptied within two hours' time. When the milk of lime in the tank is in good circulation, the valve on the container is opened and the liquid chlorine flows through the eduction pipe to the expansion coil, the rate being regulated by the expansion valve. The liquid chlorine is vaporized in the coil and advantage is thus taken of the latent heat of vaporization of liquid chlorine to cool the liquor and prevent the temperature from rising to a point where chlorine compounds which are not available for bleaching, are formed.

The expansion coil should have sufficient area to provide the necessary heat interchange, and it has been found that about 70 feet of a 2 inch lead pipe will vaporize from 1,000 lbs. to 1,200 lbs. of liquid chlorine per hour. The chlorine gas on leaving the coil enters the suction of the pump where it is absorbed by the milk of lime. The circulation of the liquor by the pump is continued until all of the chlorine is absorbed, which is indicated by a pressure gauge on the liquid chlorine pipe line. When the pointer of this gauge registers zero, all the chlorine will have been discharged from the container, which is then disconnected, the circulating pump stopped and the batch allowed to settle. When settled the

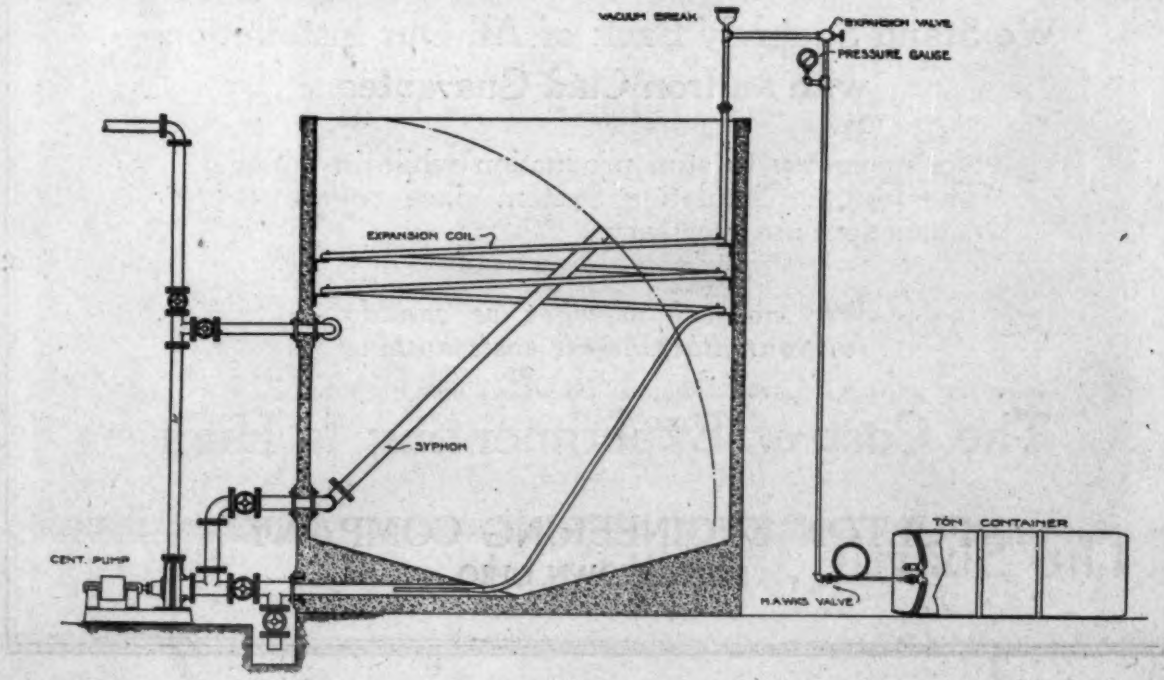

Figure 1

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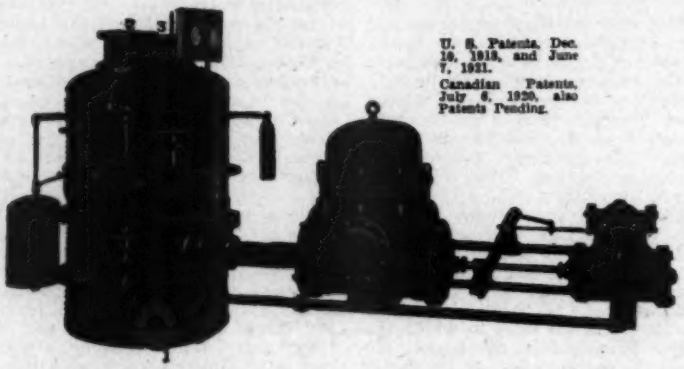

U. S. Patents Dec. 16, 1919, and June 7, 1921.
Canadian Patents, July 6, 1920, also Patents Pending.

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clear liquor is drawn off by the drop syphon and pumped to the storage tank. If the volume of the liquor in each batch is 8,000 gallons, a uniform concentration of 30 grams per litre of available chlorine of a hydrometer strength of about 6°Bé. will be obtained. There will be a gradual accumulation of sludge in the chlorinating tank due chiefly to impurities in the lime. It will be found that several batches can be run before it becomes necessary to wash the sludge. The wash liquor is pumped to a separate tank to be used as makeup liquor for succeeding batches and the sludge run to waste. The loss of chlorine from this source should not exceed 1 per cent. The liquid chlorine can be discharged from the container at a rate of 1,000 lbs. to 1,200 lbs. per hour and the batch can be chlorinated, the liquor settled and pumped to the storage tank within 6 hours. Assuming the sludge is washed after a three or four batch run, the tank will have a capacity for at least three tons of liquid chlorine per day of 24 hours or the equivalent of about 10 tons of bleaching powder. Should the sludge, however, be washed in a separate vessel and the tank used exclusively for chlorinating and settling the liquor, the capacity will be increased to 4 tons of liquid chlorine per day.

Transporting

The one ton tank in which the liquid chlorine is shipped is an all forged steel container with a wall thickness of ⅝ inch. The outside diameter is 30 inches and overall length 80 inches. The head of the drum is lap welded in the body proper and has a thickness of ¾ inch, a bonnet which is easily removed fits over the valves, protecting them from injury. Each drum is equipped with six safety plugs, three screwed into each head filled with fusible metal of fusing point approximately 150°F. The purpose of these plugs is to relieve the contents before a pressure is reached sufficient to rupture the tank in case of exposure to fire. The weight of the tank alone is approximately 1,300 lbs. and contains 2,000 lbs. of liquid chlorine. These tanks are tested for an internal pressure of 500 lbs. per square inch and comply with all the regulations of the Bureau of Explosives and Interstate Commerce Commission.

In the transportation of a commodity of the nature of liquid chlorine, it is of importance that every precaution be taken in the interests of public safety to minimize the hazard attendng its transportation and handling at consumers plant. With this in view our multiple unit tank car was designed where the individual unit carries a maximum quantity of 2,000 pounds of liquid chlorine in a container that is fully inspected and cleansed before filling, and the filling of which is carried out with absolute accuracy. (Figure 2.) No corrosion can occur unnoticed as the whole exterior is always in view.

It will be noted from the photograph the design of the car follows the standard steel underframe construction. Its novelty consists in the design of the cradles in which the tanks are held in a fixed position on the car, the cradles being in effect part of the car frame proper. The method of clamping the containers to the car frame or cradles holds them rigidly in place and prevents accidental removal from the car in transit. The containers have concave heads forming a flange or chime at each end of the container. These chimes are rolled inwardly offering an excellent means for lifting the drums with chain hooks when handling. When the check nuts are loosened the specially designed clamp which holds the containers in position on the car may be swung away, allowing the container to be freely lifted from the cradle. This handling feature is of great importance in the plant operation of filling the tanks accurately.

A consumer using say two or more cars per week will find it convenient to discharge the chlorine direct from the containers on the car by means of a header running the full length of the car. The header should be fitted with the required number of valves which can be readily connected to the valves on the containers by means of flexible copper tubing and the unit principle can be followed by connecting one container at a time to the chlorinating tank. Two or more chlorinating tanks can be run simultaneously by having the required number of supply lines leading from the header to the tanks.

When operating in this way an especial advantage of the use of the ton container is the facility afforded in carrying dead storage. The containers intended for this purpose are unloaded from the car and stored in any convenient place in the plant for use when required. They can be tiered three high if necessary and great economy in storage space is thereby effected. This does away with the inconvenience of carrying dead storage in cars on consumers tracks which must necessarily be done where the single unit car is used.

It will be seen from the description given that the Mathisson system embodies novel features which offer many advantages in the preparation of bleach liquors from liquid chlorine. The method employed for vaporizing the liquid chlorine ensures a rapid and steady flow of gas and dispenses with the use of evaporating devices which require to be steam heated, and the cooling effect on the liquor by the evaporization of the liquid chlorine will be found to be of especial advantage, particularly during the summer months when difficulty is experienced in keeping the temperature of the liquor down to avoid losses of the available chlorine through overheating.

By the introduction of the unit principle, the operation is carried out with practically automatic control and the necessity of skilled labor is not required. The lime can be so finely

Figure 2

OLIVER CONTINUOUS FILTER WITH REPULPER

A *Handicap* is alright in *golf*—
But why submit to it in *paper manufacture?*

Why grant *a handicap to competition?*

Why waste labor, power, raw material and floor space by holding to methods that the best practice has superseded?

You can *cut down production costs in four ways* by installing Oliver Continuous Filters:—

1. In washing wood pulp direct from the digesters.
2. In thickening pulp before bleaching.
3. For a decker save-all to remove fibre and filler from the white water.
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adjusted that the alkalinity of the liquor is greatly reduced with a corresponding increase in its bleaching velocity. Bleach liquors of this characteristic combined with a uniform concentration of the chlorine content enables the bleaching of the stock to be carried out with greater efficiency and economy.

With the installation of this system, no special equipment is necessary and it can be readily adapted to existing bleach plants at little expense, as where the individual bleach tanks have not the required capacity to take the full contents of the ton container, two or more tanks can be connected together and operated as a single unit. In installations of this kind, the expansion coil with the necessary connections is usually about the only additional equipment required and so little change is necessary in the existing piping and general arrangement of the tanks that the consumer is in the advantageous position of being able to utilize his equipment either for the use of liquid chlorine or bleaching powder.

Silicate of Soda in the Paper Mill*

By JAMES G. VAIL, Chemical Director,

Philadelphia Quartz Company, Philadelphia

HARDNESS and smooth finish are the qualities which the paper maker usually associates with silicate of soda. Commercial solutions of suitable composition when added to the beater and precipitated with alum impart these characteristics and give other advantages among which some gain in strength is generally observed. These results can only be secured if the silicate is used with due regard to its chemical and physical properties.

Aside from improving the properties of the paper, there are several other purposes for which silicate of soda is useful in the paper mill. A consideration of some of these is worth while from the point of view of illustrating the nature of the material as well as to call attention to the minor uses which may have escaped the notice of some who may find them helpful.

In Digester Lining Cement

Beginning in the sulphite pulp digester, we find silicate of soda as an ingredient of the cement in which the acid-proof lining is set. A reaction between Portland cement and the silicate solution is here employed to give the needed combination of resistance to water and acid. Silicate of soda alone is affected by water, and Portland cement alone is affected by acids, but the cement which contains both will, when rightly mixed and applied, give excellent service. The speed with which the reaction takes place depends on the composition and concentration of the silicate. Those forms of silicate of soda which contain a large proportion of silica and little alkali, although they are well adapted to be used in the beater, make cements which set too rapidly for this purpose. The best grade has been determined to be one in which the ratio of soda to silica is as 1 to 2.4. This is usually put on the market at a concentration of 52° B. A good cement is made by using two parts of ground quartz of 20 mesh fineness and one part of Portland cement. The silicate solution is diluted with 10 per cent of its weight of water, and mixed with the quartz and cement to a plastic condition. It is necessary to mix small batches as the setting begins in about five minutes. More water will make the cement set faster, and less will somewhat extend the time, but the most satisfactory resistance is secured from a quick setting mixture.

A slurry of Portland cement will set almost instantly if brought into contact with a high ratio silicate solution such as that used in the beater. This action is often useful in stopping leaks. The cement set in this way is not very strong but will often close the opening while a slower setting mixture used to reinforce it is making a permanent job. Silicates of ratios 1 : 3.25 to 1 : 4 may be used in this way.

Dust-proofing Concrete Floors

The high ratio silicates are also well adapted for hardening and dust-proofing concrete floors. Particularly where these are subjected to heavy wear, a treatment with a hot solution diluted enough to enable it to penetrate will be very helpful. The silicate is applied liberally with a large brush or broom to the dry surface of the concrete. Even after it has set, Portland cement will cause the silicate to precipitate to form a hard insoluble material of much the same character as the substance which hardens the paper when the silicate has been precipitated by alum in the beater. For concrete floors that are not wet, an additional amount of silicate may be used. That which is not chemically acted on by the cement dries to a strong hard mass of glass like appearance.

Silicate cements can be used for setting tile and as acid resisting material in containers for concentrated mineral acids. It is important to remember that the resistance of silicate cements to water and to acids depends on the liberation of the siliceous part of the solution in place either by something mixed into the cement as in digester lining or by contact with acid after the cement has set by drying. The effective substance in the foregoing uses is not silicate of soda itself but a product of a chemical reaction with silicate of soda.

The adhesive uses of silicate depend on its ability to dry rapidly to a strong solid which attaches itself firmly to paper and other surfaces. No chemical change is involved and consequently the dry substance is not entirely insoluble in water though the high ratio solutions are surprisingly difficult to redissolve once they have firmly set. In the paper mill proper, silicate is used for roll capping, label pasting, making splices in supercalendering, and carton sealing. For laminating solid fibre and making corrugated board for shipping containers, silicate is the universal adhesive. Pulp sheets are also laminated with a silicate adhesive to make wall board. For these purposes the more alkaline types should be avoided because they are more soluble and more likely under the influence of moisture to alter colors or adversely affect the rosin sizing.

The unaltered silicate film is strongly grease resisting and is employed on cartons designed to hold oily substances or to support a film of paraffin. Aromatic food products like coffee keep their flavor better in a silicate coated carton than an uncoated one.

As a Boiler Compound

As a boiler compound, silicate of soda serves to cause a bulky flocculent precipitation of scale forming materials instead of a dense crystalline deposit. This makes it possible to remove the impurities as mud by blowing off the boiler. The reaction is closely comparable to that in the beater except that the silicate is precipitated by lime and magnesia compounds instead of alum. The most soluble forms of silicate are best adapted for this use. A grade of 1:2 ratio is extensively employed.

The amount of water present when silicate of soda reacts with a compound which sets the silica free has a large influence on the physical character of the liberated material. If the silicate is dried in the presence of some inert material like sand and then acted on by a strong acid the liberated silica will be dense and strong. The mass will be similar in texture to concrete. But if the reacting substances come together in the presence of a great quantity of water as in the beater or in the steam boiler, the separated product is finely divided, soft, flocculent and easily suspended in the water. This condition adapts it to be distributed among the fibers of paper and retained. It acquires strength and cementing qualities only after the water has been much reduced. If you would visualize what goes on in the beater, it is essential to have the same proportion of water present that is used in practice. If you mix strong solution of silicate with a strong alum solution, a gritty mass quite unsuitable for addition to paper stock will be formed.

Its Use with Clay

Silicate of soda has the property of making clay more fluid when it is suspended in water. Mills making book paper may take advantage of this fact to handle their clay at a much greater density than would otherwise be possible. Where the consistency at which the clay may be handled through pipes or screens is the determining factor, it is often possible to put twice as much clay into a gallon of water by the simple expedient of adding a little silicate of soda to the water. The best results are secured by the use of the exact proportion appropriate to particular clay. This is always small, frequently in the neighborhood of 1 per cent. This silicate when precipitated in the beater helps the retention of clay in the paper, though the amount necessary for making the clay fluid will not be enough to give maximum effects. The precipitate formed by the silicate assists in the retention of clay. In one mill the ash of the paper increased from 6.1 per cent to 9.2 per cent due to this cause. Other mineral substances including colors are better retained when silicate is used.

Used in the beater, silicate has several points of resemblance to rosin size. It is applied as a liquid which is readily diluted by the water and thus brought into contact with each fiber. Like rosin size it loses its alkaline character under the action of alum and an insoluble neutral substance is formed which is retained by the pulp and influences the character of the finished sheet. Silicate differs from rosin

*Paper read before the Tappi meeting, held in conjunction with the National Exposition of Chemical Industries, Grand Central Palace, New York City, September 20, 1923.

Swenson Quadruple Effect used for concentrating black liquor. St. Maurice Paper Co., Cape Madeline, Can.

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size in that it does not of itself impart additional water resistance to the sheet, though cases are on record where the use of silicate increased the retention of rosin and thus appeared to add to the waterproof quality of the paper. It is essential that enough alum be added to precipitate the silicate as otherwise most of it will be lost in the white waters.

The amount of silicate to use depends on the results desired, but usually varies between two and 8 per cent on the weight of the dry fiber stock. The alum needed for its precipitation varies according to the composition of the silicate used, but is usually between 25 and 30 pounds of dry alum per hundred pounds of the silicate solution as added to the beater.

The kinds of paper that may be treated with silicate of soda include almost all the grades where hardness is an asset. Chip board made from old fiber containers contains silicate whether the paper maker adds it or not. It is used as an adhesive in the board and can be made to yield a harder, better chip stock by the simple expedient of precipitating it with alum. The amount required will vary but the beater should be made faintly acid to litmus. The silicate in an average lot of old containers will require about 50 pounds of alum per ton.

In finer grades silicate is used with starch, the retention of which it improves. The starch is heated in a silicate solution till its grains begin to swell, cooled off and put into the beater. The starch and silicate are so closely associated that when the latter is precipitated, the former is carried along. Book papers have been successfully made with silicate and starch sizing without the use of rosin. The silicate treatment makes paper resistant to printers ink even when it is immediately penetrated by water. Silicate and rosin can be used together in those papers where water resistance is essential.

A variety of other materials have been proposed for use with silicate in paper including casein, glue, soaps and Bakelite but none of these have yet become industrially important. A review of the literature of silicate of soda in the paper industry will shortly be forthcoming from the chemical department of the Philadelphia Quartz Company.

Sulphur in the Paper Industry*

RAYMOND F. BACON, Ph.D.

THERE is almost no industry in which the United States so completely dominates the world markets as the sulphur industry. Over eighty per cent of the world's consumption of approximately one and a half million tons is supplied by three American companies—the Union Sulphur Co., the Freeport Sulphur Co. and the Texas Gulf Sulphur Co.

At one time a small tonnage of Japanese sulphur was sold in the United States, principally on the Pacific coast. Japanese sulphur runs 95 per cent to 97 per cent actual sulphur and usually contains selenium and arsenic. As a result of the experience which pulp and paper manufacturers have had with sulphurs containing selenium, it is the belief in that industry that such sulphurs tend to make spots on the paper. This spotting of the paper is supposed to be due to an undue proportion of sulphur trioxide formed during the burning of sulphur containing selenium. A Swedish manufacturer, late in the war, bought twenty thousand tons of a certain sulphur. Spots immediately appeared in his mill when this sulphur was used, and in spite of all precautions which he took, he was unable to prevent their appearance until a new sulphur was purchased, when they immediately disappeared. At the present time no Japanese sulphur is sold in the United States. This is due largely to the fuel situation in the neighborhood of the Japanese sulphur deposits. In earlier times wood and charcoal from the immediate neighborhood were used in melting the Japanese sulphur. As the industry continued, the immediate neighborhood was denuded of its wood and coal had to be brought from longer distances, greatly increasing the fuel costs. Labor costs also increased, as even the cheap labor of the Orient has felt the influence of rising world prices. The general result has been that in the last two or three years Japanese sulphur has evidently not been able to compete on the Pacific coast with the American sulphurs.

The purity of the sulphur produced by the three American companies is remarkable. For days at a time sulphur wells often produce a product containing more than 99.8 per cent of actual sulphur, absolutely free from selenium, tellurium and arsenic. In fact, there is no authenticated case where any of these impurities have ever been found in sulphur produced by these companies. In view of the great purity of crude sulphur, it is rather astounding the prejudices one finds in various industries in favor of refined sulphur, as compared to the crude sulphur—thus, you will find some rubber manufacturers who believe that they must use a sublimed sulphur, while other rubber manufacturers get along perfectly well with a ground crude product.

*Paper read before the Tappi meeting, held in conjunction with the National Exposition of Chemical Industries, Grand Central Palace, New York City, September 20, 1023.

Consumption in Paper Industry

The consumption of sulphur in the United States and Canada in the pulp and paper industry is approximately 300,000 tons per year. So far as I have been able to ascertain, all sulphite pulp made in the United States and Canada is made with sulphur. No mill uses pyrites for this purpose. In the beginning of the industry in the United States, pyrites was almost universally used, as at that time it was the only cheap source of sulphur available. In this connection, it is interesting to note that in the great pulp countries of Europe, Norway, Sweden and Finland, a considerable proportion of the sulphite pulp is now made with sulphur. For example, in Sweden, which is the largest European pulp producing country, something over half of the sulphite pulp is manufactured by direct burning of sulphur, and this in spite of the fact that there are in Sweden large available deposits of very high-grade pyrites. The use of sulphur for this purpose is increasing and the use of pyrites is decreasing—the reasons for this are, of course, somewhat obvious. The use of pyrites means handling into the plant more than twice the material as compared to sulphur and means handling out of the plant a considerable quantity of cinder. It means not only an expensive installation of roasters, but it means special installation for the purification and absorption of the gases. If one should ask whether pyrites can be used in the manufacture of sulphite liquor, the answer is affirmative, but it is more expensive and much harder to operate than the use of sulphur at present prices.

The sulphur companies are continually making investigations to obtain new uses for sulphur and thus increase the markets for sulphur, and in this connection sulphur has been proposed as a sizing and waterproofing material in paper manufacture. It has also been proposed for waterproofing and stiffening wallboard and corrugated fiber. Sulphur is one of the cheapest raw materials we have and will, in time, undoubtedly find many important uses in these lines. Sulphur has most excellent waterproofing qualities, is a good heat and electrical insulator and resists the action of dilute acids, alkalies and most corrosive liquors. A sulphur composition consisting of approximately 65 per cent sulphur and 35 per cent of finely ground coke has been proposed for the research department of the Texas Gulf Sulphur Co. as a suitable material for making tanks used for holding acid and other corrosive liquors. This material can be poured and cast like ordinary sulphur, but has more strength and is much less brittle, it resists the action of dilute acids and alkalies, and because of its low cost should be of interest to the pulp industry. It cannot, of course, be used as a lining material for digestors or in other places where temperature over the boiling point of water come into play. The research departments of the American sulphur companies are always glad to co-operate with the pulp and paper industry in meeting any problems which may arise involving the use of sulphur in the pulp industry.

The Value of Physical Examinations in Pulp and Paper Mills*

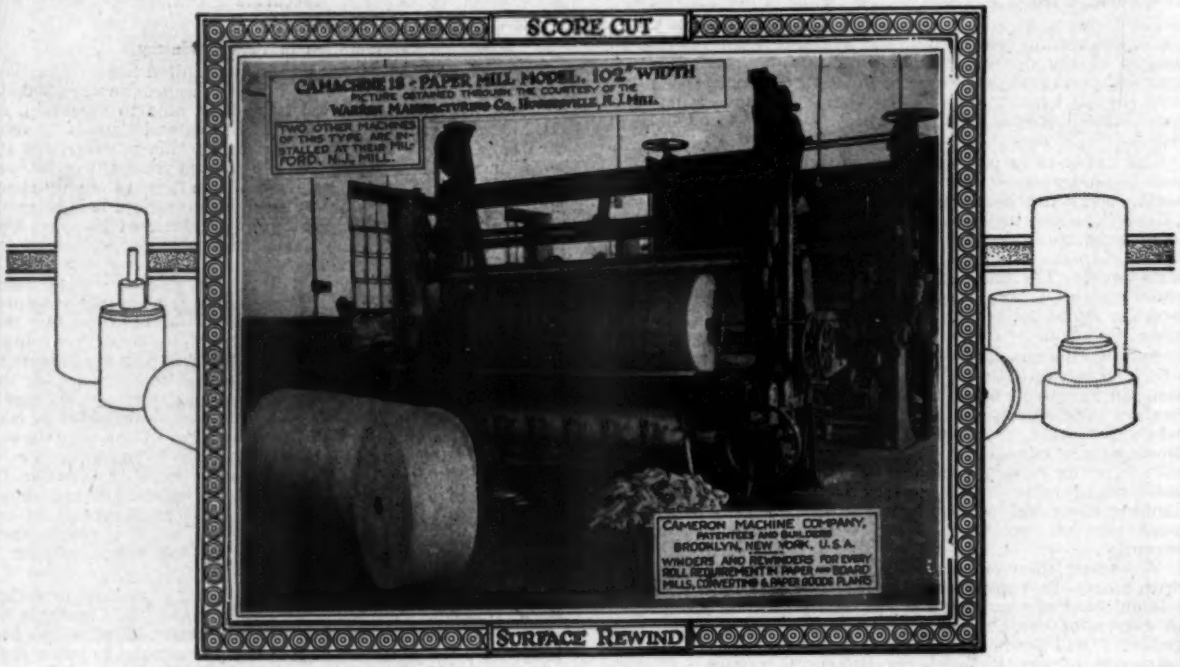
By SETH L. BUSH, Manager of Research,
Crocker-McElwain Company and Chemical Paper Mfg. Company, Holyoke, Mass.

I AM not an M. D. Lacking the training of a physician, I am therefore unable to handle my subject from the technical viewpoint of the medical man. My interest in physical examinations comes because, as an industrial relation man, I am convinced that health is an important factor in determining the peace and progress of any industrial group.

Physical examinations in our plants are but a small part of our industrial relations, and our success with them has been influenced largely by the effect of the general program. Because of this, it may be well to sketch briefly the basis of pleasant contact and relationship which had already been established before we considered the question of examinations.

About a year before, we adopted a neutral territory individual agreement, which every employee is obliged to sign, and which places upon him the responsibility of conducting himself with reason while employed and of quitting clean

*Paper read before the Paper and Pulp Section meeting at the Twelfth Annual Safety Congress, Buffalo, N. Y., October 2, 1923.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PICTURE OBTAINED THROUGH THE COURTESY OF THE
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when he goes. This agreement has apparently eliminated from our plants all questions of factional difference, whether they be of union, color, race or creed.

The service differential which we pay in increasing amounts during the first four years of employment, and our guarantee of full time employment after five years, have been attractive.

A very pleasant but informal contact has been established through workmen's committees for discussion of any and all questions of mutual interest.

All this has undoubtedly assisted us in obtaining and keeping the right kind of employees, and has overcome the natural disinclination of applicants to undergo a physical examination. The fear of some of our friends that we would be handicapped by a limited number of applications on account of such an employment requirement has not been realized.

I must confess that the first serious thought given to this question of compulsory physical examination of applicants for employment in our plants, was prompted by a selfish motive—that of dollars and cents.

We had at one plant an employee with strong indications of tubercular infection, who became the victim of a peculiar strain, which he claimed to be the result of an accident in the mill. This case dragged along for many months and before it was finally closed, we were certain that we were being thoroughly imposed upon, and that the employee in question was in no worse a condition than when he came into our employ.

About the same time we were in trouble at the other plant, with an employee who claimed he had suffered a bump on the knee, and although it developed shortly after that most of the trouble with this man came from a serious disease, which he must have contracted some time before he entered our employ, still it was with the greatest difficulty that we finally closed the case, even after it had been fairly demonstrated that the employee was a malinger.

Then we had one or two suspicious hernia cases which gave us some concern.

Physical Examinations Decided Upon

Altogether the situation seemed so grave that we talked the matter over frankly with our workmen's committee, and together decided that physical examination of applicants would be mutually advantageous to employees and management. We concluded that such examinations would protect employees from new comers who might become a health hazard to them and an accident compensation burden to the company.

The more we discussed the matter, the more we felt certain that there would also be a distinct advantage to many of the applicants themselves, through their becoming acquainted with their own physical condition.

Applicants are examined by our part-time plant physician, who calls for about an hour at the plant each day.

The examination covers the following points:

Sex, color, whether married or single, age, weight, height, eyes, ears, nose, throat, teeth, gums, temperature and pulse, arteries, blood pressure, heart, lungs, abdomen, extremities, reflexes, urinalysis and G. U.

Up to July 1, 1923, a total of 547 applicants were examined, with corrective treatments prescribed in 154 cases.

Results of Examinations

It is interesting to note that 55 hernia cases were discovered; 36 being first degree, 7 second degree, and 12 third degree. In all cases of hernia the applicant has been advised as to having an operation or procuring a properly adjusted truss. If the cases are at all advanced the employee is not allowed to work until he has procured some corrective treatment.

Thirty-two applicants were found to have venereal disease and all such cases were immediately turned over to the local public clinic.

Thirteen cases of suspicious tuberculosis were discovered and all such cases have been closely followed up, with the temperature taken each afternoon and the best possible advice given for control of the trouble.

All cases where a urinalysis has shown the presence of albumen or sugar, have been closely followed up. Among these cases were 29 pronounced diabetics.

Through examination of the ears, 27 cases of impacted wax were found, some of them quite interesting. One applicant had been almost deaf for twelve years, but after the removal of the wax, could hear perfectly.

Cases of defective eyes were followed up to arrange for corrective treatments.

In the nose examinations a large percentage of deviated septums and enlarged turbinates have been advised to see a specialist.

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All those with defective tonsils are advised as to the danger of heart infection, rheumatism, etc.

We do not employ a plant dentist but in the examination of the teeth a large field for preventive work has been shown. Much Riggs disease has been found, turned over to the family dentist and followed up.

Wherever a high rate in blood pressure has been noted the applicant is advised as to treatment, and the case is reported to the family physician.

Many interesting cases have been found but it is only such cases as refuse to have proper treatment that are definitely turned down.

One man refused to get a truss for a second degree hernia and was consequently not allowed to go to work.

One potential apoplectic was advised as to his condition, and was persuaded to look elsewhere for easy work.

Many times it has been fairly demonstrated that the healthiest looking individuals may have serious complications.

One case of a perfectly normal appearing man of good weight and stature was discovered to be such a serious diabetic that after a conference with his family physician, he was advised to take much lighter work than he had been in the habit of doing.

A very recent case was that of a well appearing young man, above the average in intelligence, who was welcomed with open arms by the employment office and by the foreman who had a vacancy, only to discover through the physical examination, that he had a serious spinal curvature, strong indications of tubercular trouble, a tendency toward diabetes, and had undergone a serious operation, which together with the other indications absolutely unfitted him for anything like the work he was contemplating.

This brief recital of the results of our examinations will serve, I am sure, to demonstrate fully that the physical examination is of very definite value to the applicant himself. We have satisfied ourselves that there is a large enough percentage of serious accident and health risks among applicants to make the examination very much worth while, from the viewpoint of the Company.

Celebrates Franklin's Coming to Philadelphia

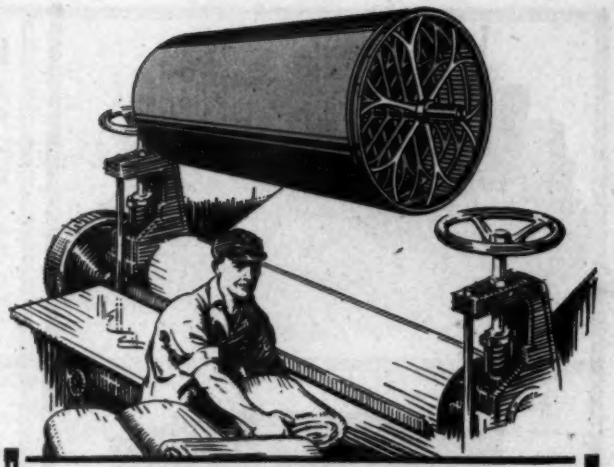
Two hundred years ago this October, Benjamin Franklin made his first entry into Philadelphia—the city he afterwards made famous.

To commemorate this event the Dill & Collins Company, paper makers of Philadelphia, have gotten out a book entitled "The Pictorial Life of Benjamin Franklin, printer, author, editor, publisher, stationer, typefounder, inventor, scientist, philosopher, statesman, diplomat and philantropist."

With text as well as pictures, the book establishes the greatness of Franklin in every one of his many fields of human endeavor. One of the great pictures in the history of America, known to every school boy, is that of 17-year-old Ben walking up Market street, with his future wife, "Debby" Read, staring at his shabby appearance from the doorstep of her father's home. This picture has been adequately painted for this book, by N. C. Wyeth, who is one of the country's first painters in the field of "costumed romance." Mr. Wyeth's painting is reproduced in process color as the frontpiece.

For the patriotic American and student of history, the most surprising feature to be found in this interesting book is the list of 49 achievements accredited to Franklin. These with the pictures give a veritable panorama of the great career of one of the greatest men in all history. They bring home to every reader the overwhelming conviction that the greatness of Benjamin Franklin is not properly appreciated; that here is a man who has never received half the rightful credit that is his due. In his own particular field which was that of printer, author, editor and publisher, Franklin's pioneer achievements are unknown even among printers, publishers and advertising men. This book says that Franklin was the father of modern advertising, and explains why; that he was the first to demonstrate the power of newspaper advertising to sell goods and carried nearly five full pages of advertising in his newspaper when advertising in other papers consisted still of only notices of sales of houses and lands, notices of runaway servants, and notices regarding horses and cows that were "Lost, strayed or stolen."

More interesting still, according to "The Pictorial Life," Franklin drew the first newspaper cartoon, the picture of a snake cut into thirteen sections to represent the 13 colonies; was the first to attempt to illustrate the news in a newspaper; and was first to publish questions and answers in a newspaper. Another fact not generally known is that Frank-



Do you select your cylinder moulds with the same thoroughness that you would a paper machine?

Do you know why Appleton Cylinder Moulds give exceptional service and have long life?

We will be glad to send you descriptive literature.

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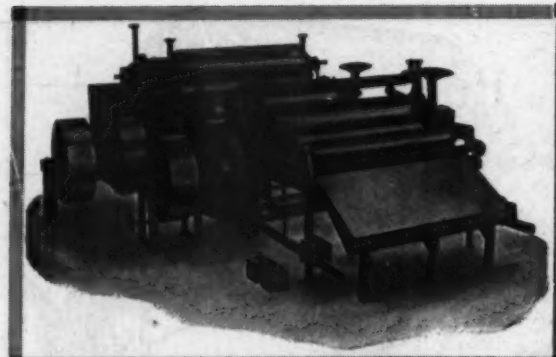
Designers and Builders of Paper Mill and Pulp Mill Machinery at
APPLETON, WISCONSIN



Rogers and Special Wet Machines

SINGLE AND DOUBLE PRESS
FOR CONVERTING CHEMICAL PULP INTO SHEETS 48% DRY

25-30 TONS air-dry pulp per 24 hours. Built in 72" width only, with patented pulp weakening and separating device or our new automatic knife cut-off attachment.

FREIGHT CHARGES are greatly reduced. Savings on this item alone often pay for the machine in one year.

All infringements will be vigorously prosecuted

The Wood's Machine

Used as Pulp Thickeners, Savealls, Pulp Washers and Water Filters

ADVANTAGES:

Reduced Wire Costs	No Couch Roll
Enormous Capacity	Minimum Repairs
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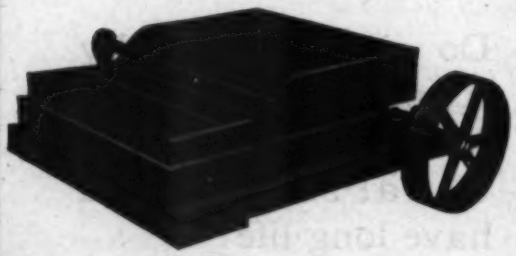
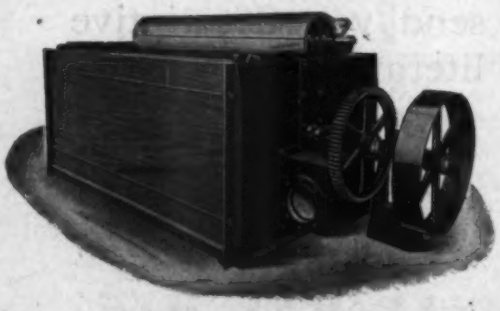


Wells Undulating Knot and Sliver Screen

Will bear closest investigation from every angle. It separates knots and slivers from all kinds of pulp efficiently, continuously, automatically with negligible cost for operation and upkeep. Simple but rigid construction. Only best materials used. Operation in plain view.

60 TONS DAILY CAPACITY, STANDARD SIZE. WRITE FOR BLUEPRINT AND FURTHER INFORMATION



Improved Decker

Single or Double Cylinder Type

Built in the following sizes:

Cylinder mould diameter, 36" or 40".

Face of cylinder mould, 72", 84" or 96".

Cylinder mould of best reinforced construction and properly supported with our latest design outside bearings.

Vat furnished either all wood or with cast-iron ends.

For Stability and Efficiency our Improved Deckers are Unexcelled

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

OUR LINE IS MANUFACTURED IN CANADA BY

THE NORTHERN FOUNDRY & MACHINE CO., LTD., SAULT STE. MARIE, ONT.

lin's "Pennsylvania Gazette" was the best newspaper and the most successful newspaper in all the colonies.

As an inventor, the following inventions are credited to Franklin: Water-tight compartments for ships, a copying press for taking copies of letters and other writing, the first smoke-consuming stove or furnace, the first mangle for ironing clothes, bifocal lenses or near and far-sight glasses, the Franklin stove which was the first successful wood-burning stove, and the lightning-rod.

As a statesman, Franklin, not Jefferson, is here credited with being the founder of the democratic party in American politics. Franklin suggested the idea of Wolf's expedition which made Canada a British province. Franklin devised the first scheme for uniting the colonies, more than 20 years before the Revolution; and his plan was finally adopted in all of its essential features and binds our Union together today. Of interest also is the speculation offered in this connection, that an earlier adoption of Franklin's ideas would have prevented the Revolutionary War, and would have won our independence for us without a single battle. Franklin's compromise idea, "The happiest political expedient ever devised," saved our Constitution. This was the suggestion he made for two houses of Congress, which prevented the breaking up of the Constitutional Convention. The fact that Franklin was the first man to be called the "Father of His Country," is also of interest.

But the greatest achievement in Franklin's life was his "Deliberate and final choice to dedicate himself to virtue and the public good." He made a comfortable fortune in the printing business in 20 years, and then retired from active business, at 42 years of age, to devote the remainder of his life to scientific study and to doing good."

Supporting Paper Exchange Idea

Following are abstracts of two letters received from John R. Mauff, Executive Vice-President of the Paper Industries Exchange, Chicago, commenting on two articles written by Thomas J. Burke, entitled "Competition and Costs" and "Service and Selling," published in the August and September issues of THE PAPER INDUSTRY:

"May we call your attention to an article 'Competition and Costs' by T. J. Burke, C. A., which appeared on page 769 of your August, 1923, issue?

"His reference to this exchange and his comparison with certain other exchanges is very much to the point and we are very glad to have him take an interest in what we are trying to accomplish. Nevertheless, his conclusions are at fault, because the machinery of this exchange does not provide for trading in what are known as futures, that is, contracts for future delivery.

"On the grain exchanges, such contracts are in large volume and call for delivery in public warehouses within the switching district of Chicago where warehouses are under the jurisdiction of state authorities and receipts are registered by the state, insuring, in that way, absolute safety as to the grain being on hand when called for. These warehouses contain many millions of bushels of grain and the proprietors are not permitted to own any of it—this grain belonging to the public. This permits trading in futures, because there is always a surplus on the market so that purchase and sales are easily accomplished.

"There is another very important department, however, that has to do with the cash grain receipts and the grain bought and sold "to arrive,"—in other words, the cash grain department, the "spot market" as sometimes designated. It is this particular branch of the exchange system that we have adopted. All sales are for immediate or prompt delivery and you can readily see that no one would dare to engage in any manipulation either up or down on such short time contracts.

"Furthermore, there has never been the slightest doubt about the legality of such trading. The famous Call Board case involving the Board of Trade of the City of Chicago was decided by the Supreme Court of the United States in favor of the exchange and by this learned body declared that instead of being in restraint of trade it broadened the trade, with equality of operation to large and small dealers alike."

Service and Selling

"I have read with interest the article on 'Service and Selling' in your September issue. This is an attack directed at the Paper Industries Exchange by T. J. Burke, who is an officer of the Salesman's Association of the Paper Industry.

"The Paper Industries Exchange was designed to benefit the producers and buyers of paper products. Manifestly

Pulp and Paper Mill Machinery

Equipment of high quality manufacture which fills a need around Pulp and Paper Mills is being offered for sale by the Old Hickory Powder Plant at money saving prices.

Mammoth Jr. Jordan Engines. Maker Noble & Wood Co. Shell 5 ft. 6 in. long, with 10-in. inlet and 6-in. outlet. Capacity, 30 tons per 24 hours. Will run either direction at 350-375 R.P.M. Fitted with steel bar knives, block and oak fillers.

Welded Steel Digesters. Maker, Continental Iron Works. Capacity, 1300 cu. ft. Inside diameter, 8 ft. Length, overall, 27 ft. Working pressure, 110 lbs. per sq. in. Tested, 165 lbs. per sq. in. Each digester complete with cast iron supporting ring, hoppers, guides, and all accessories.

823 H. P. Stirling Boilers, type M-30, 200 lbs. pressure, with Westinghouse 8 retort stokers, Buffalo stoker engines, Vulcan soot cleaners, 100,000 cu. ft. capacity forced draft fans, Bailey flow meters, and all accessories.

Alberger-Curtis Boiler Feed Pumps, 8", 3 stage, 1050 g.p.m. capacity, direct connected to 181 H.P. Alberger-Curtis Steam Turbines, 150 lbs. working pressure.

Buffalo Forced Draft Fans, type T-D 9½, 100,000 cu. ft. capacity, direct connected to 225 H.P. Moore Steam Turbines.

Feed Water Heaters	Compressors
Corliss Engines	Accumulators
Motors	Steel Tanks
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No. 7 Tanks
No. 8 General Equipment
No. 14 Chemical Equipment
No. 15 Transmission

Write for prices, specifications, and further information

Old Hickory Powder Plant
Jacksonville, Tennessee

EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made entirely from Spruce grown in the forests of Northern Maine

Write for samples and prices

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then it could not deliver a beneficial result if it handicapped the sales departments or lessened the value of the salesman's services to his employer, a member of the Exchange.

"It seems desirable, however, to answer some of the objections raised by Mr. Burke. He says in the first place that all successful exchanges deal in materials, the quality of which can easily be ascertained. He means by this that the products traded in must be capable of standardization. This may be admitted. Paper products are capable of standardization. The Paper Industries Exchange has taken and is taking definite steps toward the standardization of all paper products so far traded in. This in itself is highly beneficial to the paper industry. Any system of trading which makes for standardization is to be encouraged.

"Mr. Burke next suggests that such trading will result in inevitable disputes concerning classification and grading. It would seem obvious that the fixing of definite standards tends to lessen rather than to increase disputes. Whether trading is on 'change or off 'change there may be disputes between buyers and sellers as to whether a particular commodity is of a particular grade. When such disputes occur, the Paper Industries Exchange offers a means for their settlement through arbitration by experts. No argument is needed to convince a business man that this method of settling is an improvement over litigation as now conducted.

"Mr. Burke next complains that members accused of offenses against the Exchange may be required to produce their books, thus revealing trade secrets. Similar inspection provisions are found in the by-laws of all Exchanges such as the Chicago Board of Trade and the New York Stock Exchange. Members who conduct their business honestly and who live up to the rules of the Exchange need have no fear of such inspection provisions.

"Mr. Burke points out the necessity of educational propaganda for the purpose of instructing the public concerning the various uses of paper products. This is altogether beside the point of the present discussion. The Paper Industries Exchange does not interfere with such propaganda by its members; on the contrary the Exchange may be used as an important means of increasing such propaganda. Mr. Burke finally urges that the Exchange emphasizes price versus quality. The reverse is true. By establishing standards and fixing differentials between different grades the importance of quality will be emphasized rather than minimized.

(Signed) "John R. Mauff."

Apprenticeship in Pulp and Paper Industry

AT A meeting held in the Statler Hotel, Buffalo, on September 12, plans were inaugurated for the development of apprenticeship in the industry. Committees of three associations, the Technical Association, the Canadian Technical Section and the Superintendents Association, met together and formed a joint committee to bring the interests and activities of the three associaions in cooperation.

At the meeting which was called by A. P. Costigane, chairman of the Apprenticeship Committee of the Canadian Technical Section, there were present A. P. Costigane, A. Nelson Gain, J. N. Stephenson, T. Linsey Crossley and George Carruthers of the Technical Section; J. S. Schumaker, chairman of the Apprenticeship Committee of the Superintendents Association and C. N. Brautlecht; R. S. Hatch, chairman of the Vocational Education Committee of the Technical Association, R. S. Kellogg, W. S. Lucey, F. C. Clark and W. G. MacNaughton. This committee, since its inception, has included apprenticeship in its objects.

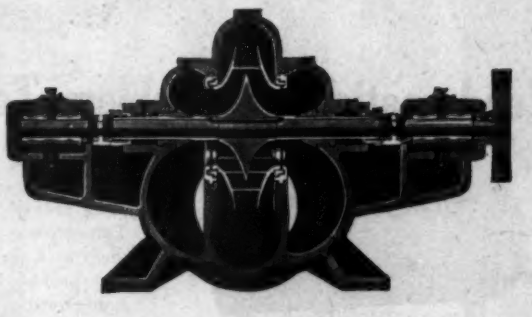
After some discussion of the objects of the joint meeting the following resolutions were adopted:

First, That the members of the different associations, representing their associations, are in favor of the formulation of plans to develop apprenticeship training in the pulp and paper industry and to outline for its introduction.

Second, That it is further the sense of the meeting that the apprenticeship system be directed towards providing from the rank and file of employees additional skilled men fitted for more responsible positions in the pulp and paper industry.

Third, That a Joint Committee on Apprenticeship in the Pulp and Paper Industry be formed, to consist of the chairman of the committee of each association, together with one other member of each committee chosen by his chairman.

After these resolutions were carried the Joint Committee was constituted as follows: A. P. Costigane, George Carruthers, J. S. Schumaker, C. N. Brautlecht, R. S. Hatch, F. C. Clark. A meeting of the Joint Committee thus constituted was immediately held and A. P. Costigane was elected chairman with W. G. MacNaughton who was asked to act as secretary.



Every Pump a Masterpiece

THE efficiency, general running qualities, and other characteristics of a centrifugal pump depend in part upon good finish and correct adjustment, and by careful hand fitting and finishing, individual pumps of cheap construction can sometimes be made to show good results on test.

Perfect construction and performance is insured in every De Laval pump, however, by our system of manufacture to limit gages on an interchangeable basis. The running clearances, for example, should be accurate, not only to avoid rubbing and wear, but also to permit of reducing leakage and slip to the lowest practicable amount. The limit gage method of manufacture enables us to reduce these clearances to the minimum in each and every pump produced. During manufacture the parts are repeatedly inspected by an inspection department which is independent of the production department, and finally, when the machine is completed, it is thoroughly tested by a third independent department, which certifies concerning both the satisfactory mechanical operation and as to the fulfillment of guarantees as to head, capacity, efficiency and power consumption. A De Laval machine is a standardized, perfected article, which must be right in every respect in order to get out of the shop.

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312

Condensation—a Problem Today—an Asset Tomorrow

Today it may be clogging your paper machines or mill heating system, retarding steam circulation, lowering production and cutting your profits. But install a Morehead Back-to-Boiler System and **Tomorrow** every drop of condensation will drain from your equipment as it forms. Temperatures will rise, and with them production and profits. The condensation—piping hot—will be available for boiler feed water and can be returned to the boiler **without pumps.** Thousands of Morehead installations are yielding big returns to their owners in increased production and lower fuel bills. One can do the same for you. Write for complete information and proof.

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Soot blowers having automatically operated valves were originated and developed by us, and are covered by patents issued and pending. Infringements of these patents will be prosecuted.

DIAMOND POWER SPECIALTY CORPORATION
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American Manufacturers Lose Kraft Paper Dumping Case

The Treasury Department has found that there was no dumping of Norwegian Kraft paper during the early months of 1922, after an exhaustive investigation of the whole Norwegian paper situation both here and abroad. It is apparent that the decision was rendered on the basis of the importers' admission that the Kraft paper they were importing was not up to the standard of the American made Kraft, though no official announcement is made by the department authorities. The American paper manufacturers through the American Paper and Pulp Association, showed the great damage done to the American paper market by the importation of great quantities of Norwegian and other northern European Kraft paper, in the loss of business sustained through such importations. It was shown that the foreign paper was brought in and offered at prices below the American cost of manufacture. The importers who protested against the ruling that there had been dumping laid great stress on their statement that Norwegian Kraft was not up to the standard of American Kraft, and that therefore the American manufacturer was not injured by competition of an inferior article. The case was heard before McKenzie Moss, Assistant Secretary of the Treasury, who has ruled that the American manufacturer has not been injured by Norwegian competition, though it was shown by governmental agents that the prices in the United States for Norwegian Kraft were 17 per cent below the prices for the same paper in Norway.

In speaking on the question of quality in the hearing before Judge Moss, counsel for the importers made this statement; referring to American manufacturers: "Their prices are higher and their merchandise brings a better price because it is better in quality and they take better care of their customers."

Casein in Coated Papers

With regard to casein in coated papers, La Papetrie states that although it gives fairly good results it is not as satisfactory as gelatine, due to the fact that it is more easily decomposible than the latter, and hence it must be used within a short time after it is prepared. Not more than forty-eight hours should elapse between its preparation and use, especially in the summer time. Formaldehyde can be added as a preservative, but then the casein preparation is thickened and prevented from working properly.

It has been found that borax and ammonia are the best solvents to be used with casein in preparing it for use in coated paper manufacture. Borax is preferred to ammonia, and about 10 per cent of either solvent is used. It is well, however, that when the casein is mixed with substances that have an acid reaction a slight excess of ammonia should be added in order to prevent the casein from thickening.

Foaming in the sizing tub can very readily be prevented by the addition of a little milk or oil of turpentine to the coating solution, or by allowing amyl acetate to drop slowly on the solution.—The Paper Maker.

Proper Use of Cost Data

Following are some abstracts of the address on the proper use of cost data by trade associations, given by R. S. Kellogg at the meeting of the National Association of Cost Accountants, held in Buffalo, N. Y., on Septembr 13, 1923.

"We get the benefit of trade standardization daily from the bed we sleep in—if we are not too tall—the paper we read and the breakfast we eat in the morning and our means of travel to our daily task—afoot or awheel—to the coffin we are buried in and the insurance policy left to our dependents. Human beings cannot live together without standardization.

"Trade associations have opportunity for great service to their members and the public through the study of all items of cost and the setting-up of honest cost standards.

"The cost accountant has a great function to perform and great opportunity for service in the ascertainment of the economic facts essential to sound business and industry. His national association is to be congratulated upon its leadership in such development."

Red Cross Roll Call

The paper trade in New York City is co-operating actively with the Red Cross in its annual Roll Call, which opens Armistice Day, November 11, and continues until Thanksgiving, for the enlistment of new memberships to maintain the organization's manifold peace-time program of relief and public health work.

Three special committees, composed of representative leaders in the various branches of the paper trade, have been

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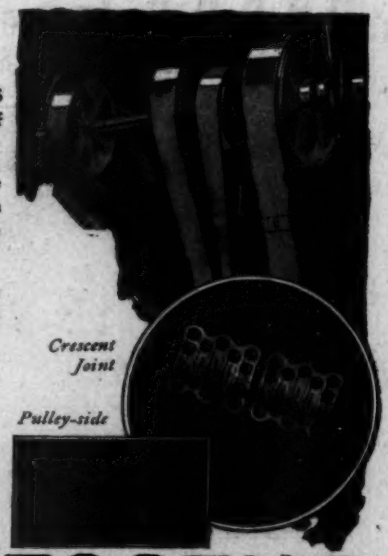

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BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

formed in accordance with the campaign plan of organizing the entire city into various industrial, mercantile and professional groups to facilitate the Roll Call effort.

Each committee is headed by its own chairman. Joseph McCormick, of the American Paper Mills Company, 261 Eighth avenue, is acting as chairman of the Paper Manufacturers and Paper Dealers group; A. D. Morstadt, of the Union Paper Company, 844 Washington street, is chairman of a similarly organized committee to cover the Paper Boxes group, and a Stationers group is functioning under the chairmanship of William E. Ward, of John Ward & Sons, 115 Cedar street.

These special Roll Call committees are functioning actively to secure the maximum response to the Roll Call throughout their particular field, and plans are already under way to reach every person in the paper trade directly with the Red Cross appeal.

Help for the ex-service man and his family, including legal assistance, loans of money, advice on domestic matters and medical care constitutes a major part of the work in New York for whose maintenance the annual Roll Call is conducted. The Red Cross activities in the city also include disaster relief and a public health program whose features are the supplying of surgical dressings to 22 local hospitals, nursing service, first aid, and work in home hygiene and care of the sick.

Remove the Threat

The tendency towards atrophy of the lumber business is shown in the census report just published by the Department of Commerce. This tendency is largely due to our dwindling forests and growing remoteness of supply, says the New York State College of Forestry, Syracuse University.

The total value of lumber and lumber products manufactured in 1921 was $2,429,500 against $3,070,072,000 in 1919. Much of this might be accounted for by the temporary decline of prices from the peak that was reached in 1919 and 1920 but the number of establishments and the number of employees engaged in the business also showed marked reductions which under lower prices and an active demand would normally increase.

In 1919 there were 839,000 persons in the manufacture of lumber and lumber products. In 1921 there were only 675,000 which is below the figures of 1914 when there were 833,000. The number of establishments turning out lumber and lumber products in 1921, 20,273, shows a decrease of nearly fifty per cent in two years, there having been 39,955 in 1919. In 1914 more than twice as many plants were in operation with about a third more wage earners than in 1921.

There have been many consolidations of establishments but not enough to account for this loss in the number of plants doing business nor the decrease in employees during these brief periods. Other records show that in seven years before 1919 New York lost 35 per cent of her secondary woodworking industries—plants using planed lumber. This is an indication of what is going on in the depleted forest areas of the east. It has just come to public notice forcibly that a large majority of our pulp and paper mills would be compelled to locate in Canada or shut down if an embargo on pulp woods should be enforced by Canada. Labor and industry sorely need more forests in this country. The sooner we start planting trees on an adequate scale the sooner will this threat to one of our big business interests disappear.

Large Alaskan Pulpwood Sale

According to reports from the Forest Service of the U. S. Department of Agriculture, the firm of Hutton, McNear & Dougherty, of San Francisco, have purchased the timber rights to the Cascade unit of pulp timber, located on Thomas Bay, in the Tongass national forest, Alaska.

This sale is claimed to be the largest sale of pulp timber ever made by the Forest Service, amounting to 334,000,000 cubic feet of timber, or about 3,340,000 cords. The bids were for 60 cents per cord for the Sitka Spruce timber which forms 27 per cent of the stumpage, and 30 cents per cord for the Western Hemlock, which forms 72 per cent of the stumpage. The remaining timber is composed of Western Red Cedar and Alaska cedar for which the contract price is 60 cents per cord.

The contract also bound the purchaser to build a pulp mill of not less than 100 tons daily capacity at the Cascade Creek water power site on Thomas Bay, which is located 20 miles from Petersburg, Alaska.

The erection of the new dam of the Wausau Paper Mills company at Brokaw, Wis., is going on without interruption. The coffer dam is completed and the foundation and abutments for the new structure is now in progress.

Regarding The Coal Situation
Your firm may not have been affected by the closing of the anthracite mines in Pennsylvania, but there are thousands of industrial plants in the country that are confronted with a coal handling problem of equal magnitude.
It is one accomplishment to secure delivery of fuel and an equally important accomplishment to handle it efficiently and economically after it arrives. The inevitable delays, frequent demurrage charges, excessive labor costs and the general "lost motion", consequent to hand shoveling, have become matters of vital consideration to prominent executives.
It has been our privilege to offer a solution to this problem for hundreds of firms with an installation of Godfrey Equipment that has paid for itself many times over in the tremendous saving it has effected. The original cost in some cases has not exceeded the price of a good truck.
What we have accomplished for other industrial plants, we can accomplish for you. Our staff of engineers will gladly show you just how our equipment will meet your individual requirements, without obligation. Write or wire us today.
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Albany Felts will help you produce good paper at minimum cost. Economical because they stand up under the wear and tear of factory use.

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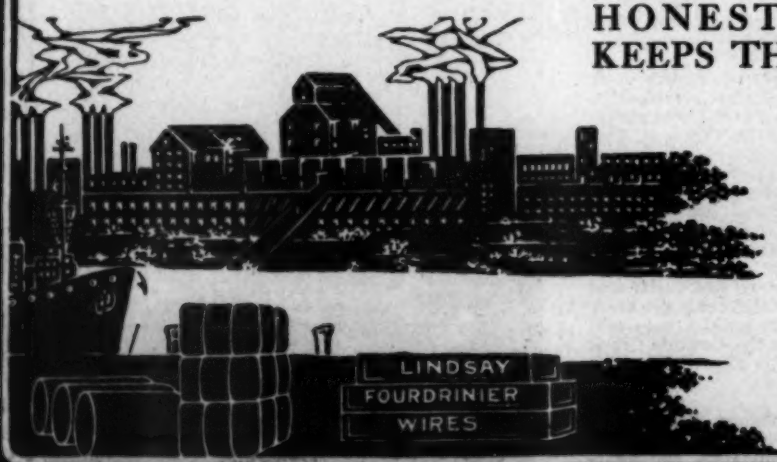

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New England

Boston, October 1.

Holyoke resumed operations. This was the outstanding feature of the past month but there are other important developments. The American Writing Paper Company's troubles were by no means ended when the firemen returned to work at their old scale of wages. The company's financial troubles are pressing for attention. President Willson has announced that the plan for the deposit of preferred shares is being agreed to, and when sufficient shareholders have thereby assented to the plan it is expected that a certain sum, probably $25 per share, will be asked in assessment. There is no disguising the stringency of this concern's financial position. Its bank loans are not easily renewed, some banks are said to have refused to do so, and paper stock packers have been unwilling to sell the company rags, pulp, or waste paper on usual terms, but are demanding excessive prices as an inducement for the risks of giving any credit. A company such as American Writing with its equipment steadily falling behind that of the other Berkshire mills in point of modernity and efficiency, is an unhealthy factor in the trade, and New England is earnestly lending itself to any real solution that will make them a sound concern. The present management inherited all its troubles. The ability of Mr. Willson and his advisers is not to be questioned for a moment.

Shortage of water in the mill streams of New England has been a serious factor this past month, causing mill closings in Lawrence, Fitchburg, and at scattered Connecticut Valley points. The great Crocker Burban Co. Association at Fitchburg, was forced to suspend manufacture in several of its eight mills for a time, and was forced to the expedient of pumping back water that filtered over the dam, to get sufficient for stockwashing.

Trade itself has not improved in the manner that it was expected to this fall. Of late, activity among some of the board mills has improved but with the exception of a few of the Berkshire district writing paper mills there is hardly a mill in New England that could not stand additional business, and this includes all the book paper mills.

Attempt Made to Make A. W. P. Co. Insolvent

On September 29th, Emanuel Kaiser, a stockholder of the American Writing Paper Company, filed a petition in the state of New Jersey, to have a receiver appointed for the above company. The bill set forth that the assets of the company totaled $22,149,896, and that its liabilities, including common and preferred stock, totaled about $35,128,000. It said that the company lost $513,000 in the first four months of 1923 operations. It charged that the firemen's strike this summer caused $1,000,000 depreciation, and that the increase in operating cost due to the strike will be $750,000.

Evidently the A. W. P. Co. convinced Mr. Kaiser that he had taken a wrong step in trying to force the company into insolvency, for on October 5th, word was received that the case had been dropped.

Mr. Willson, president of the company, was appointed by the courts of New Jersey as equity receiver of the company, and as ancillary receiver by the courts of Massachusetts.

The following is a statement made by Mr. Willson:

"The next move will be determined at the meeting of the creditors of the company, the 18th. If it is their idea that the terms of the present receivership offers the best way out of the company's difficulties, the order will be made permanent at that time.

"Personally, I feel that the receivership is a constructive step in the company's affairs. It is clear that prompt re-organization is necessary. The receivership offers the shortest possible road to accomplishment.

"From the manufacturing viewpoint, the American Writing Paper Company is about as well off as the rest of the industry. We have a good supply of orders. Under the broad powers of the court order we will go right ahead making and selling paper and I feel confident that the move will not only result in better things for the American Writing Paper Company, but for the city of Holyoke as well."

Strathmore Meeting

The third annual executive meeting of the Strathmore Paper Co. was held at the Woronoco Inn, Woronoco, Mass., on September 17, 18 and 19. Over 100 of the largest paper merchants in the country attended and were royally entertained by the Strathmore Paper Co. in general and President H. A. Moses in particular. The first day a dinner was enjoyed at Mr. Moses' farm outside the town, following which a talk was given by Col. B. A. Franklin at the Strathmore Community

Cleveland Worm Gear Reduction Unit applied to Rogers Wet Machine. Motor 25 H. P. at 800 R. P. M. Reduction in worm drive 13 2/3 to 1.

One way to increase efficiency in power transmission

THE subject of efficient power transmission is of prime importance not only in new mills but also in those that are constantly striving to increase efficiency and lower production costs by the elimination of needless waste through old-fashioned equipment.

Besides doing away with an endless number of hangers, pulleys, belts, gears, etc., the Cleveland Worm Gear Drive shows greater efficiency in the transmission of electrical power.

It permits standardizing on high speed motors.

It fits in with the modern idea of placing machinery to be driven in groups, gives an even flow of torque, permits a right angle drive and greater compactness and space economy.

Cleveland Worm Gear Drives operate with least noise, and contribute increased labor efficiency. They show amazingly low maintenance cost as a result of simplicity—only two moving parts, exclusive of bearings the worm and the gear, and the only attention required is to keep supplied with oil. They are very durable.

What are you planning in the way of increasing power transmission efficiency? Would you like to have our engineering department cooperate with you toward the end of higher efficiency in drives? We are always glad to do so. Our latest bulletin on worm gearing will be sent free on request.

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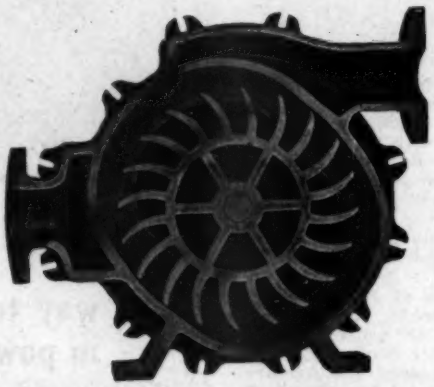
REDUCTION UNITS

THE HYTOR VACUUM PUMP FOR FLAT BOX SERVICE

Vacuum Produced Absolutely Without Pulsation

No Vibration

Saves Wires



Only One Moving Part

No Rods, Pistons, Crank Shafts, Loose Moving Parts, and No Gears

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FOR ALL PIPING JOBS YOU CAN RELY ON "TOLEDOS" ALWAYS

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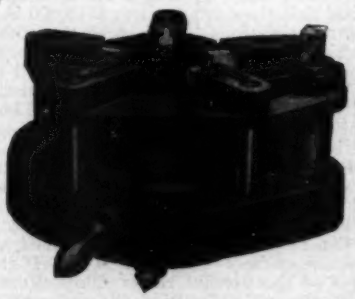

No need to take the pipe down to be cut and threaded when "Toledos" are in your equipment. On an instant's notice the portable "Toledos" are put to work anywhere, and the job completed with scarcely a moment's delay.

"TOLEDO" PIPE THREADERS AND CUTTERS

light, portable and compact will handle any pipe cutting or threading job up to 12". Though efficient when hand operated when connected to the "Toledo" Power Drive, they are instantly converted into the most highly efficient of power equipment, and at a fraction the cost of power machines.

A post card will bring you full information about this remarkable equipment.

THE TOLEDO PIPE THREADING MACHINE CO. Toledo, Ohio

New York Office: 50 Church Street

House, on the company's paper distribution system. He pointed out by chart how certain parts of the country were not selling as much Strathmore lines as they might and generally indicated those sections that were doing the best work.

The afternoon entertainment consisted of an auto trip to the Eastern States Exposition held near Springfield, Mass., where horse racing and fruit, cattle and other exhibits were examined.

The second day was given over to a study of the Munsell system of colors, as exemplified in Strathmore papers. Every agent received a "Bazaar of Color" explaining the Munsell system for printers and other consumers. The Munsell system is the method of securing the correct proportion of color in any advertising, catalog or other printed effect. The Tuesday meal was enjoyed at Woronoco Park, where a big clam bake was enjoyed. Various sports were also enjoyed, including an impromptu baseball game. Following this came the farcical election of officers for Strathmore Town. The Eastern States Exposition was again visited on Tuesday, the second day, where a fireworks display and vaudeville made up the entertainment. Wednesday, the delegates listened to a talk on the quality of Strathmore papers, given by C. W. Dearden and C. F. Norton. The afternoon of the third day was given over to golf, and this concluded the three-day meeting, voted unanimously as supremely successful from both a business and social point of view.

The financial troubles of the George W. Wheelwright Paper Company appear likely to be eventually adjusted to the satisfaction of all concerned. A creditors committee consisting of Morris Gintzler, of the J. Andersen Company, pulp importers, Amor Hollingsworth, of the Penobscot Chemical Fibre Co., Maine pulp makers, and W. P. Simonds, of the Train Smith Co., paper stock dealers, has been formed. Practically all of the three score or more creditors have agreed to the plan whereby the George W. Wheelwright Paper Co., will be allowed to pay its obligations within six months with interest, or within a year. The Company has started to retrench in earnest. It has given up its suite of offices on Franklin street, Boston, and will conduct the business from the mill office at Leominster, in the future. A meeting of the creditors committee was held Wednesday, September 26, but no statement was made. The company's unfortunately poor cash position was the result of faithful observance of contract on their part whereby they accepted full shipment on high priced pulp, paper stock etc., at a time when cancellation of contracts was resorted to freely by others.

Northeastern Superintendents' Meeting

The Northeastern Division of the American Pulp and Paper Mill Superintendents' Association held their fall meeting at Groveton, N. H., on October 6, Saturday. There was a business meeting at 11 a. m. Luncheon was served at noon, following which the party paid a visit to the plant of the Groveton Paper Company, which is a large sulphite bond and manila plant, making also some waxed specialties, as well as tags and textile wrappers. The sulphite mill, which was on the program of inspection, is one of the most modern in New England.

Following this visit a paper was read by G. D. Jensen Co. on the Decker process used in cooking sulphite, and another by Mr. Lucas, superintendent of the Copsecook mill of the S. D. Warren Co., on "Paper Making." General discussion followed, and as usual in such instances, many new ideas were broached, suggested by the papers read or by things noted during the trip through the mill. The banquet in the evening was enjoyed as guests of the Groveton Paper Co., following which Mr. Davis made an interesting address.

The Maine Central Railroad held a hearing at its offices in Portland on October 2, the second within two months, on the subject of increased rates on pulpwood. Strenuously opposed as the new rates are by the mills, it seems likely that they will become effective. Proposed increases range from 25 per cent to 100 per cent. Some modifications may result as a result of the mill protests.

During the last two weeks of September, hearings were held in Ford Hall, Boston, by the Interstate Commerce Commission regarding the advisability of consolidating the New England lines either as a regional group, or with some of the trunk lines. The trunk line merger was strenuously opposed by paper interests, who held that such a merger would eliminate good service to consumers not on the lines of the particular trunk line on which the freight originated. C. L. Whittemore, traffic manager of the New England Paper and Pulp Traffic Association, spoke in favor of the New England sys-

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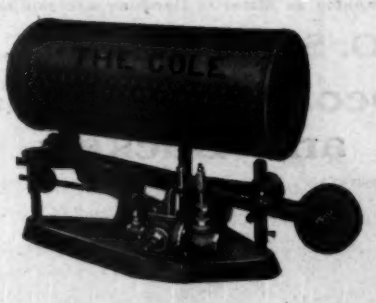

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The Cole System

of handling Steam Condensation

For Storage Heaters, Drying Coils, Pumps and Power Plant Specialties Write

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BACK TO NORMALCY

Owing to substantial reductions in the cost of all materials entering into the construction of Jenssen Acid Towers, we are now building them at

NORMAL PRICES

Will YOU let us show YOU how to make MONEY by making a

BETTER ACID

Don't forget that every second sulphite mill on this continent is using our towers, so ask your neighbor what HE thinks of them.

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The Howard Pulp Refiner

MAKES your pulp of better quality. The action of the Howard Refiner is to brush out any fibrous material to pulp with a minimum of injury to the fibre.

The quality of pulp produced will be found much better than the pulp as generally reduced. This improved quality means a higher net value per ton.

The Howard Refiner is a time tried machine. It is in use in many paper mills in the United States, Canada and other countries and is giving excellent results

Detailed information will be gladly furnished on request.

Manitowoc Engineering Works
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Rigid Economy in Material Handling accomplished with

O. S. DEPENDABLE

Locomotive Cranes and Buckets

Rapid in operation Low maintenance cost

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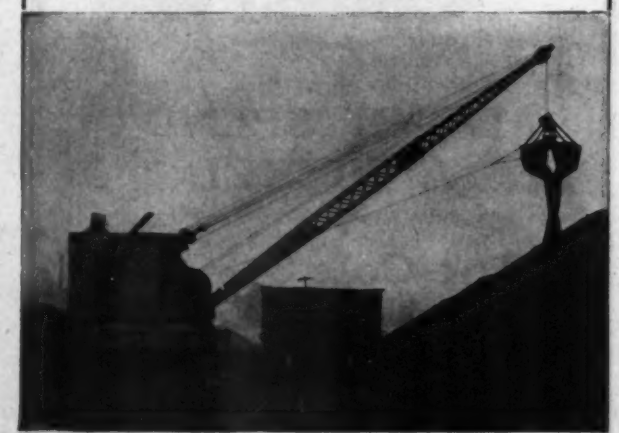

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Draper Hollow Balanced Brass Balls

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Absolutely balanced; will not pound out of shape

Specify these when ordering new pumps.

Order these to replace worn-out balls.

We make a specialty of repairing stuff pump balls.

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SOLID BRASS BALLS
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The Draper Manufacturing Co.
Port Huron, Mich. Petrolea, Canada
Every ball bears our registered trade-mark

tem, and A. P. Lane, traffic manager of the Great Northern Paper Company, which ships more than 60,000 cars of paper each year, praised the service given his company by the Boston & Maine and was against any merger with trunk lines.

Hugh Chisholm, president of the Nashwaak Pulp and Paper Company of New Brunswick, as well as president and general manager of the Oxford Paper Company of Rumford, Me., has returned from Canada, and his visit is said to have been connected with the deals involving the taking over of the Clarke mill at Bear River, Nova Scotia, as well as some additional pulpwood areas in that province. The mill of Clarke Bros., Ltd., at Bear River, has a capacity of 50 tons of sulphate pulp daily. The Oxford Paper Company is gradually making itself impregnable from a pulpwood standard. Its Nashwalk mill in New Brunswick has a daily capacity of 75 tons of bleached sulphite pulp. In addition it owns extensive pulpwood areas in the St. John River valley, and in parts of Nova Scotia.

Timberland Owners Before Senate Committee

A committee of the United States Senate, consisting of Senators Moses, Fletcher, Fernald and Representatives White and Clark, sat at Bangor, Me., on September 27, to hear evidence regarding the necessary steps to be taken on reforesting the country. Many paper mill executives were present and among those who offered convincing testimony was D. A. Crocker, of the Lincoln Pulpwood Co., subsidiary of the Eastern Mfg. Co., and Dr. H. P. Baker, of the American Paper and Pulp Association. Maine timberland owners protested high taxes, which they declare is forcing them to sell their growing lands, asked for greater fire control and government aid in fighting the spruce budworm.

B. Parker Babbidge

Hollingsworth & Whitney Co. lost an able executive, and the community a citizen of high character when B. Parker Babbidge passed away at the Brooks Hospital in Brookline, Mass., on Friday, September 28. Mr. Babbidge, who went to work for Hollingsworth & Whitney in 1887 as a boy, worked his way to the position of chief of the company's huge bag department by sheer ability. He was not favored by pull, but by an ability to learn the details of his business thoroughly. The Boston office of Hollingsworth & Whitney Co. closed on Tuesday, October 2, as a mark of respect to Mr. Babbidge and 48 of the executives and other employes of the Boston office attended the funeral services at the home in Salem.

American Writing Celebrates Semi-Centennial of Progress

The American Writing Paper Company of Holyoke, Mass., have gotten out an attractive broadside commemorating the celebration of their semi-centennial of progress. This company owns 16 of the 25 paper mills located in Holyoke.

Of the 4,000 or more skilled paper-mill workers employed in Holyoke, 2,187 are employees of their Eagle-A mills. More than 400 of these expert craftsmen have been with the company 25 years or longer. Next year the American Writing Paper Company will observe its silver anniversary—25 years of service and of contribution to Holyoke's preeminence for quality papers.

The Great Northern Paper Company will probably complete, before the end of the year, its large new power plant at Anson, Me., approximately across the river from their news and bag paper plant at Madison. The structure is 189 feet long and will house five water wheels eventually, which will be driven by a 20 foot head of water. An average of five hundred men have been employed at Anson for a year erecting this plant. At the same time the company is installing new machinery at the Madison mills, rebuilding and enlarging the wood room preparatory to receiving the electric current from the Anson plant.

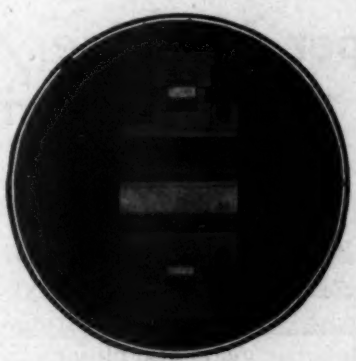
O. Hodgkins Company, for over 30 years paper stock packers on Commercial Wharf, Boston, moved on October 1, into commodious quarters on Dudley street in the Roxbury district of Boston. This company excels in the packing of heavy book stock, ledgers and writings and other high-grade lines. Their new plant adds still another to the rapidly expanding list of modern paper stock packing plants in the Boston district.

D. DeStef Company, Inc., one of the leading New England paper stock dealers, is constructing an addition to their plant which is estimated to cost upwards of $50,000. The new building will be of brick and will extend the company's front-

HOFFMANN

PRECISION ROLLER BEARINGS

FOR HEAVY LOADS AND HARD SERVICE: STANDARD AND SELF-ALIGNING TYPES



"RTN" TYPE
(Self-Aligning)

Equipped with clamping sleeve and nut. Made to inch dimensions in light and medium series.

Heavy-duty units built to the highest standards of precision; affording maximum serviceability under conditions involving heavy loads, temporary overloads, shock, jars and vibrations: offering new opportunities for power saving and reduced upkeep costs.

Our engineers will welcome an opportunity to work with yours, in the application of these high-duty, high-precision bearings to paper machinery, with a view to securing maximum anti-friction efficiency, minimum maintenance costs, and continuity of service.

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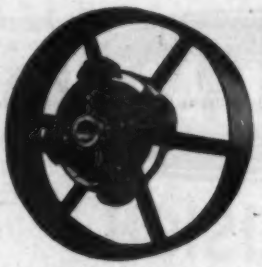

FALLS SOLID FRICTION CLUTCH PULLEY

A complete line of

Power Transmission Machinery

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BELT AND ROPE DRIVES

MANUFACTURED BY

THE FALLS CLUTCH & MACHINERY COMPANY

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FOR SALE
Paper Machine Marshall Drives

Ten Rice Barton & Fales self-contained four-bearing type with ring oiling bearings, mortise gears and pinions, 57 teeth and 14 teeth, 6″ face. Friction clutch cone pulleys 40″x20″.

By Frank H. Davis Company
175 Richdale Ave.
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VEELOS
Genuine Balata Belting

The Ideal Belt for Paper Mills
Highest Quality Material
Best and Finest Workmanship
By Most Highly Skilled Craftsmen
Power-Saving Long-Lasting
On Service Basis Cost Is Lowest
Try a VEELOS

THE STANDARD BELT OF THE WORLD

Manheim Manufacturing & Belting Co.
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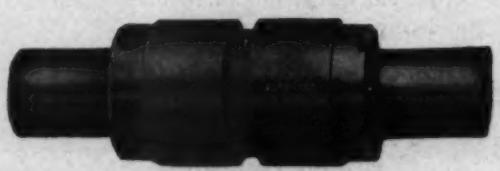
THE JOHNSON FRICTION CLUTCH



Double Clutch Exterior

Is Also a Clutch for Reverse Drive on PAPER MACHINERY

When used on the countershaft one pulley is mounted on each hub of clutch and thru one open belt and one crossed belt the operation of a machine may be quickly and easily reversed.
Reverse motion may be obtained by installing the clutch between bevel gears on machinery.
Spur gears are often used to get two speeds on machinery.
The Johnson Clutch requires the minimum of space. It is smooth in its pickup and does not grab like a jaw clutch.

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THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

age on Damrell street, South Boston, 300 feet. Modern equipment, including electric Minnich baling presses, are being installed.

The Uncas Paperboard Company of Norwich, Conn., is adding a new wet end to the largest of its three machines, equipping the same machines with new dryers and making other improvements designed to improve the quality and increase the production of the mill. The company has been operating successfully since its purchase by J. E. Smith, of Baltimore, last winter.

The Maine Coated Paper Company, subsidiary of the Oxford Paper Company, has been enjoying an unusually brilliant run of business. It is at present five weeks in arrears of orders, an indication of the excessive demand for the products of this mill.

Hollingsworth Whitney Co., have filed a suit in Federal Court at Boston to recover $626,363 which they claim was overpaid as excess profits in 1917. In that year the company was assessed $2,000,000 for excess profits. A date for trial has not been set.

The National Waste Paper Company of Providence, R. I., has been incorporated under Rhode Island law. The incorporators include Mayer Levitt, 145 Adelaide Ave., Providence, Arthur S. Galkin and Joshua Bell.

Tileston Hollingsworth Co.'s new machine starts in operation at the Mattapan mill this month. It will increase the net output of the company from 10 to 20 tons of English finish and machine finish book paper per day.

Northern New York

Watertown, N. Y., Oct. 1, 1923.

Knowlton Brothers of Watertown, one of the oldest paper making firms of the Black river valley, have just taken out with the Travelers Insurance Company a blanket life and total disability policy covering their 120 employees. The individual policies range from $500 to $1,000 each, the $1,000 policies going to employees in the service of the company five years or longer. Employees with four years' service are protected to the extent of $900; three years, $800; two years, $700; one year, $600; six months or less, $500. The total of the policy is about $100,000, and the premiums are met by Knowlton Brothers.

David M. Anderson, vice-president of the St. Regis Paper Company, has leased the historic residence at Sackets Harbor built by Colonel Kind in 1817, which he formerly owned. Mr. Anderson bought the property in 1914 and a year or so later sold it to John F. Moffett, whose daughter, Miss Janet Moffett, now owns it. The house is constructed of brick brought from England, and is one of the group at Sackets Harbor put up in the early part of the 19th century, when the village was a busy shipping port.

The Paper Industries Exchange announces that a branch Exchange will be opened in the Pershing Square Building, New York City, by not later than October 15th.

Clarence A. Mack, formerly in the wholesale paper business in Watertown, died recently at the age of 49. He had been retired since 1912.

Michigan

The Eddy Paper Corporation of Kalamazoo, Mich., are enlarging and making many new improvements to their mills at Three Rivers and White Pigeon, Mich. An entirely new office with 7,500 square feet of floor space has been laid out. A storage building is being erected at Three Rivers and a traveling crane to handle rolls of paper and other heavy articles has been installed. Several new improvements will be installed in these mills in order to increase production.

$20,000 Flood at K. V. P.

A flood resulted from a small leak in a pipe under the filtration reservoir of the Kalamazoo Vegetable Parchment Company's plant at Kalamazoo, Mich., Wednesday, September 12th.

The leak was being inspected by President Jacob Kindleberger and Ralph Clark member of the company's engineering staff, at the time the outer wall of the filtration plant gave

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The Mitts & Merrill Shredder will reduce magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock in a thoroughly economical manner.

Built in sizes with spouts ranging from 18 to 45 inches wide.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

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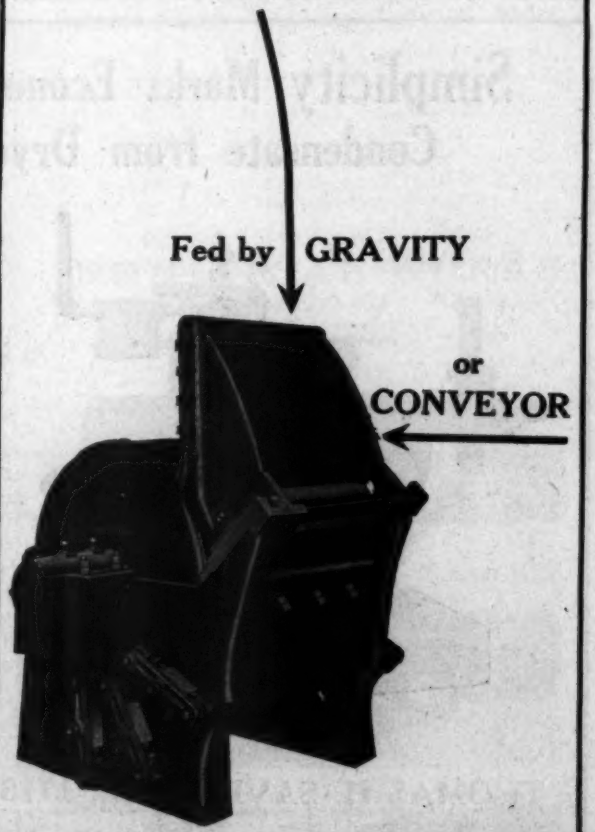
Saginaw, Mich.



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Watertown, New York
Digester, Acid Proof and other Guaranteed Linings
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Steel Plate Construction
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Steel River Barges and Plate Work of all Kinds
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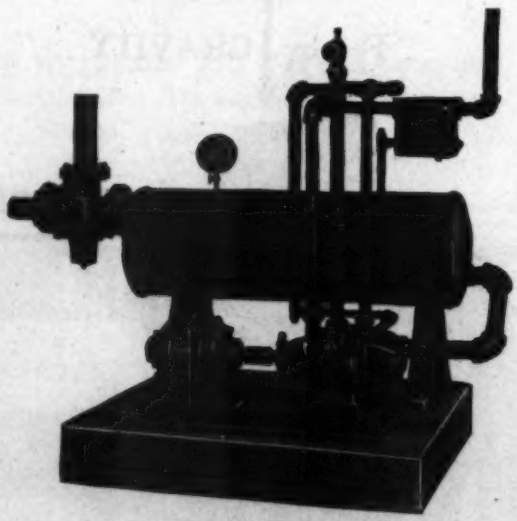
TAYLOR'S SPIRAL RIVETED PRESSURE PIPE

For many years the preferred piping in Paper and Pulp Mills
LIGHT STRONG DURABLE

Sheet Steel Fittings Made to Individual Requirements
AMERICAN SPIRAL PIPE WORKS
P. O. BOX 485 CHICAGO

Simplicity Marks Economical System for Handling Condensate from Dryers of Paper Machines



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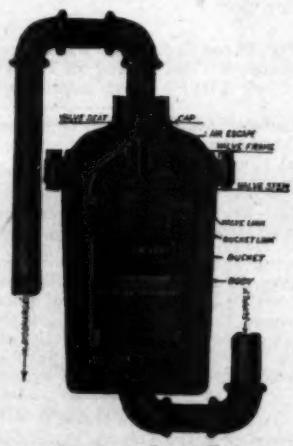
This is now in very successful operation in many mills throughout the country and our repeat orders are best testimonials.

This system comprises the **Jennings Hytor Dryer Exhaust Unit** and the **Armstrong Steam Trap** with **my special arrangement of piping,** an Armstrong Trap being installed on the return line from the condenser dryers with the main return header connected directly with the Jennings Unit, thus insuring circulation and highest efficiency of dryers.

For Full Particulars, Address



Armstrong Steam Trap

THOMAS H. SAVERY, JR., 1718 Republic Building, CHICAGO, ILL.

way and fell outward, carrying the inner wall with it. They narrowly escaped getting caught in this collapse.

A torrent of water rushed out, wrecking the filtering basin, tearing up the interurban track, smashing steel high tension line poles, and completely flooding the yards and basement of the plant of the Western Paper Makers' Chemical Company.

Thousands of cylinders of resin and other paper making materials were tossed about like corks. A loss of $20,000 was estimated as a result of this flood. The operations of either plant were not interfered with, however.

St. Joseph Mill Under New Head

The Mullen Paper Mill of St. Joseph, Mich., which has been closed down for the past year under bankruptcy proceedings, has been recently purchased by Chicago paper men and will operate under the corporate name of Mid-Lakes Paper Co.

The president of the new concern is W. H. Fairchild, who is also president of the Mid-West Paper Box Co. of Chicago. The Mid-Lakes Co., however, will be an independent concern, according to reports. The new superintendent is Milton Slocum of Kokomo, Ind. The mill will start operations at once.

The Dunn Sulphite & Paper Company, a $50,000 concern, which was recently organized at Detroit, Mich., will erect its plant in Port Huron, Mich., on property leased from the Grand Trunk railroad at the mouth of St. Clair river. Theodore Dunn of Detroit is the president of the new company. Mr. Dunn was formerly connected with the Detroit Sulphite & Paper Co.

The Valley Paper Company is the name of the new paper company recently organized in Kalamazoo, Mich. The capital stock was voted at $500,000. Plans for the erection of a modern one-machine mill will start in the immediate future.

Joint Convention at Appleton

The Superintendents Association, Technical Association and Cost Association of the Pulp & Paper Industry will hold a joint convention at Appleton, Wis., October 26 and 27. This is to be a National convention for the Technical Association and a Northwest event for the Superintendents and Cost Associations.

Their schedule of meetings is as follows:

Friday morning, the 26th, will be taken up with registration and mill visits.

There will be a Joint Session Friday afternoon, from 2 to 3 p. m., followed by separate sessions in separate halls that afternoon and evening.

Saturday morning, the 27th, will be given over to a visit to the Kimberly-Clark Company's mill, followed by a luncheon by that company at Kimberly.

All three sessions will hold separate meetings Saturday afternoon. Saturday evening, a joint banquet and entertainment will conclude the convention.

If possible, the Technical Association will hold Committee Meetings on Thursday evening, October 25th, before the joint session convenes.

So that there will be no chance of failure to supply accommodations, registration for rooms should be sent in early, to Mr. Corbett, Secretary of the Chamber of Commerce of Appleton.

The following papers will be presented at the Superintendent's meetings:

"Beaters and Beating," by C. E. Youngchild.

"Colors," by K. T. King of the DuPont Co.

"Wires," by G. E. Buchanan of Appleton Wire Works, and John Watson of the Wisconsin Wire Works, both of Appleton.

"Sulphite." It has not yet been determined who will present this paper.

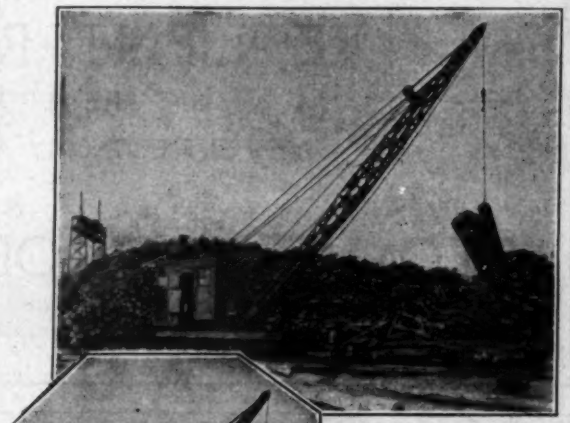
"Heat Losses," by E. P. Gleason of the Nekoosa-Edwards Paper Co.

"Oiling," by C. H. Brownley of the S. F. Bowser Co.

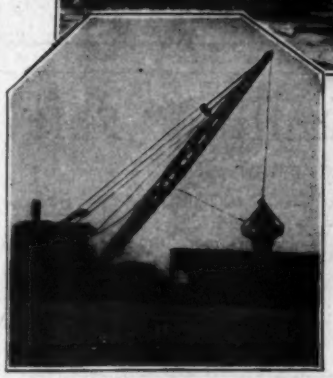
"Felts," by A. H. Thuerer of the Appleton Woolen Mills.

"Groundwood," by Lyman Beeman of the Consolidated Waterpower & Paper Co.

The Dells Paper & Pulp Co. of Eau Claire, Wis., are tearing down their old pulp mill, which will be replaced by a new



At the American Splint Corp., piling short logs 45 ft. high. Saving $16,000 yearly over hand labor



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With hook and block unloading, loading, piling logs, ties, timbers and all heavy units.

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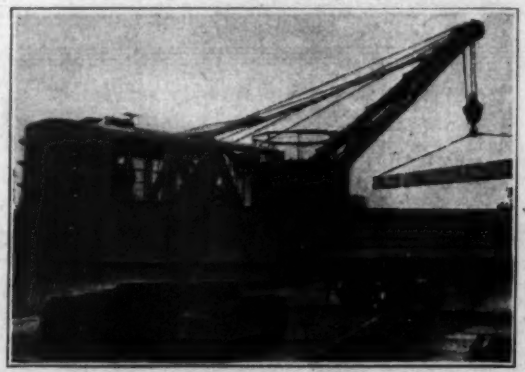
NEW YORK CHICAGO PHILADELPHIA DETROIT
E. H. HOPKINS & CO., LTD., MONTREAL, TORONTO

For operating on rails, crawling tractor belts or broad gauge tractor wheels. Steam, electric or gasoline power



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THAT ARE SPRINGY BUT NOT SOFT

GIVE FELT ECONOMY AND STAND UP IN SERVICE

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The Rubber Roll Makers

NEWTON UPPER FALLS, MASS.

The "Hamilton" Felt

For Kraft paper our Style No. 8 or Style No. 25, Common Fourdrinier Wet, in combination with Style No. 18 Super Press P. are popular with many paper makers.

A trial is invited if you are not running them.

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MANUFACTURERS OF

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DRYER FELTS

English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width

Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIBUNE Three Ply Felts for Coarse Papers.

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SKANEATELES FALLS

New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

and modern structure. What the size and dimensions of the new building will be and other details have not yet been worked out, it is understood. They are also contemplating building a new dam with a head of 26 feet of water to take place of their present dam.

The Wausau Sulphate Fibre company of Mosinee, Wis., has renewed its offer to give waste lime to farmers who come after it and hundreds of wagon loads have been taken for the improvement of Marathon county soils. The company has arranged with the county agent for shipping the lime in carload lots to parts of the country too far to haul by team and only the cost of handling is charged to the farmers.

The Riverside Paper Fibre Co., of Appleton, Wis., has superstructure work in progress on its new local mill, estimated to cost $150,000, with equipment. Plans are for the installation of equipment at an early date.

New Vegetable Parchment Mill in West

Operations of the sawmill unit of the new $1,500,000 Columbia River Paper Mill, of Vancouver, Wash., commenced early in September. A flurry of interest has been aroused among the paper trades, because this new mill will, for the first time in paper manufacture of this territory, devoted its ultimate productive output to vegetable parchment paper. At the present time this must be shipped in from the East, and need for such a product has been felt in the northwest for some time.

Hemlock, grown in the immediate vicinity is now being cut at the rate of 125,000 feet per day, under the executive supervision of W. D. DuBoise and J. J. Donovan, vice-president and secretary of the new corporation. The refuse from this cutting will, within two months, be manufactured into wrapping paper at the rate of 40 tons per day. For some time, until the vegetable parchment manufacturing equipment is installed and in operating condition the output will be chiefly wrapping paper.

The new corporation is particularly well manned, so far as executives are concerned. Both DuBoise and Donovan are men of wide lumbering experience, and also hold active interests in the DuBoise Lumber Co., of Vancouver, Wash., as well as plants at Bridal Veil, Cascade Locks and Buxton, Ore. Mr. F. W. Leadbetter, president of the Columbia River Paper Mills, has for many years been an executive with the Crown-Williamette Paper Mills of Oregon City, and is still president of mills at Salem, Ore. and Los Angeles. Hamilton Corbett, as treasurer, represents the highest type of recognized financier that this conservative territory possesses. All stock is owned by people in the direct vicinity of the mills, mainly in Vancouver, Portland and Salem.

In three distinct units, the new plant will possess a geographical advantage second to none. River or rail shipments are at meeting points at the company's wharves. The building, which is designed by the Austin Co., is tile and brick, with ventilated steel sash.

It is reported that the Zellerbach Paper Company have recently purchased a 25 acre site in Los Angeles, Cal., and intend to immediately start erection of a $2,000,000 paper mill. The factory to be built by the Zellerbach Paper Company will be operated by the National Paper Products Company, a subsidiary corporation of the concern, and will employ about 400 persons.

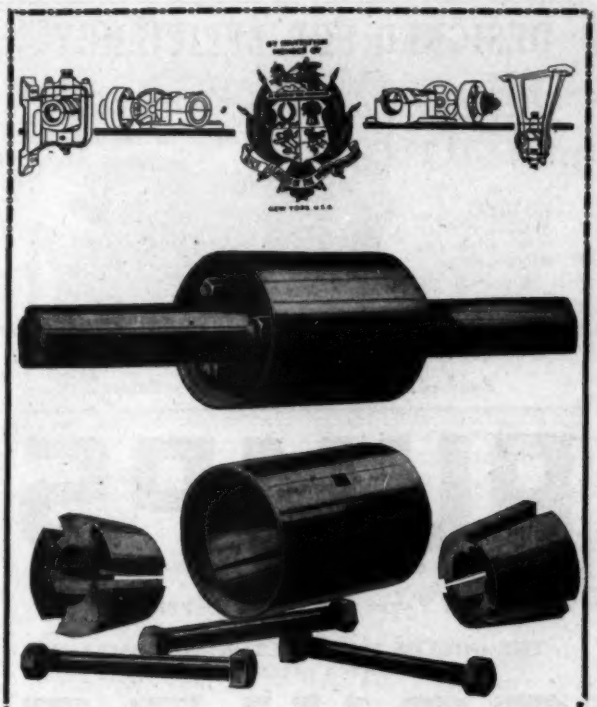
The Washington Pulp & Paper Company of Port Angeles, Wash., will start the erection of a two-story concrete building, 210 by 68 feet in size, which will house their acid plant. This is the first work on their large extension plans.

Brown Paper Co. Builds $2,000,000 Mill

Satisfactory progress is being made on the construction of the $2,000,000 paper mill being erected at Monroe, La., by the Brown Paper Mill Co., Inc. Several contracts have been awarded, and the company hopes to have the plant completed and in operation by June 1, 1924.

George F. Hardy, of New York, is the engineer and architect, and the Morton C. Tuttle Company, of Boston, are the contractors. The paper machine is being built by the Pusey & Jones Company, of Wilmington, Del.

The stack will be built of radial brick and will be 250 by 12 feet. This will be built by the Alphons Custodis Chimney Construction Company, of New York. The boilers will be installed by Phillips Badenhousen, of Philadelphia. Each



A Coupling that is as Strong as the Shaft Itself

The Double Cone Compression Coupling, as we make it, is absolutely the strongest coupling of the compression type.

Correctly proportioned to transmit the full capacity of the shafts it connects.

Each shaft is firmly held by a separate cone, and the cones are wedged and keyed into a continuous double-tapered sleeve or cover, overcoming any slight variation in shaft sizes, thus insuring perfect alignment in all cases. Then, too, they are

Easily Applied or Removed

We also make a belt type, Flexible Coupling for directly connecting Motors or Engines to Shafts or machines, and, in fact, everything for the mechanical transmission of power by belts or ropes.

T. B. WOOD'S SONS CO.
CHAMBERSBURG, PA.

POWER TRANSMITTING MACHINERY

DESIGNED FOR EFFICIENCY

TABER Pumps fulfill the particular pumping needs for which they are especially built. Forty years' experience in Pump building justifies our well-earned reputation as "PUMP SPECIALISTS."

Submit your pumping problems to us for advice

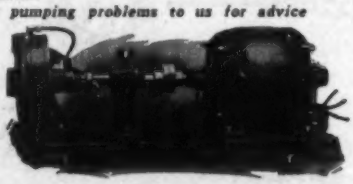


Fig. 694 Illustrates Taber L-O 1¼x1" motor driven centrifugal pump.

TABER PUMP CO., Buffalo, N. Y.

"Pump Specialists"

Builders of Centrifugal and Rotary Pumps

PUMPS

INDUSTRIAL—AGRICULTURAL—MUNICIPAL—RESIDENTIAL

A Type for Every Service

THE GOULDS MANUFACTURING COMPANY

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GOULDS

Aurora Centrifugal Pumps

Type OMD

Aurora pumps are made in many types, to meet all conditions found in the paper mill field.

We specialize in horizontally and vertically split open and inclosed impeller, single and multi-stage and deep well turbine centrifugal pumps as well as deep well reciprocating pumps.

A card from you stating your conditions places our engineers at your service and results in a saving to you.

AURORA PUMP & MFG. CO.

Home Office and Factories, Aurora, Ill., U. S. A.

Frequently a single large pump can replace a large number of smaller pumps and will save considerable horsepower. Our engineers will gladly assist you with your pumping problems.

ALLIS-CHALMERS

MILWAUKEE, WIS. U.S.A.

boiler will have a heating surface of 8,550 feet. All electrical equipment, including paper machine drive, will be installed by Westinghouse. W. M. Kellogg Company, of New York, has the contract for furnishing the digesters, and the Shartle Bros. Machine Co., of Middletown, O., are to furnish the Jordans and beater equipment. Claflins by the Herman Manufacturing Company, of Lancaster, O. The Chesapeake Iron Works, of Baltimore, Md., will equip the mill with electric cranes, and the Reading Chain & Block Corporation, of Reading, Pa., will put up the hand-operated cranes. All structural steel will be furnished by the Virginia Bridge & Iron Company, of Roanoke, Va.

The foundations are in, and steel erection was scheduled to begin October 1 and is expected to be finished by December 22.

The Leesburg Fibre Pulp & Paper Co., Leesburg, Fla., have purchased property in Jacksonville, Fla., and are planning the erecting of a paper plant. The main mill will be 50x300 feet, with adjoining smaller structures for the sorting department, beater rooms, rotary cooking department, pulp tankage department, machine shops, power house and miscellaneous structures. The cost is estimated at $500,000. They will manufacture wrapping and Kraft papers.

It is reported that the Celotex Co., of Marrero, La., manufacturers of composition board from bagasse, has work in progress on plant enlargements to more than double the present output. The installation will include additional grinding machinery, drying equipment and power units, with auxiliary equipment, to cost more than $300,000.

The Daily News Paper Corp., of Wilmington, Del., propose to erect a $3,000,000 plant at North Tonawanda, N. Y. Plans for the plant have been completed and it is reported that a contract for its erection has already been awarded. This company is a subsidiary of the Ontario Paper Co., of Thorold, Ont.

It is reported that plans are now under way for the construction in South Jacksonville, Fla., of a paper making plant that will employ 160 men to start. The factory will make pulp of Florida sawgrass. The main building will be 60x200 feet, and will cost $500,000, it is estimated.

Correcting an Erroneous Report

The following letter, dated October 9th, was recently received from the Dill & Collins Co., of Philadelphia, Pa.:

"In order to set at rest the ridiculous publicity that has been given to the chlorine accident at our Manayunk plant on the 4th instant, we feel it would be a service to the industry if an accurate statement were given of the happening, and we would be very much obliged if you will publish it.

"One Philadelphia evening paper in scare headlines stated that 'Forty-three persons were gassed.' What actually happened was that six of our employes and two city firemen were slightly overcome with chlorine. No one was seriously injured and all had returned to work recovered on Monday morning, the 8th.

"The trouble was due to the operator improperly adjusting the yoke or clamp that attaches the discharge valve to the chlorine drum. Only 25 pounds of chlorine in all escaped to the atmosphere.

"Most of the excitement and exaggeration was supplied by employes of adjacent plants attracted by the unusual character of the accident, and by reporters thirsting for a thrill.

"We feel very much chagrined that so much publicity has been given to a comparatively trifling incident.

"(Signed) Howard W. Taylor, Vice-Pres."

Foreign Correspondence

Process for Making Sulphate Mixtures of Clay for Paper Manufacture

For the above a German expert has recently made an invention which has now been patented and is worth description. The materials containing the clay are boiled with sulphurous acid, under pressure or without, which depends on the kind of raw material, and avoids the material becoming solid. The latter is done by diluting the mixture with water at the end of the boiling and mixing the excessive free sulphuric acid, if there is any, with certain alkalis, which are added best in the form of paste. For this purpose the compositions of magnesia, which are valuable as sulphates, together with sulphurous clay during the sizing of paper, are best suited. Magnesia, carbonate or hydrate of magnesia, dolomite and magnesite are the best. Clay alkalies, alumunat or hydrate of clay, which

TRADE JENKINS MARK
Jenkins Bros

Fig. 334, screwed, Standard Iron Body Quick-Opening Gate Valve with sliding stem and lever.

Quick-Opening Gate Valves

Jenkins Gate Valves with sliding stems are quickly opened or closed by a pull of the lever attached to the stem. The small lever is used to hold the gate at any position it is desired.

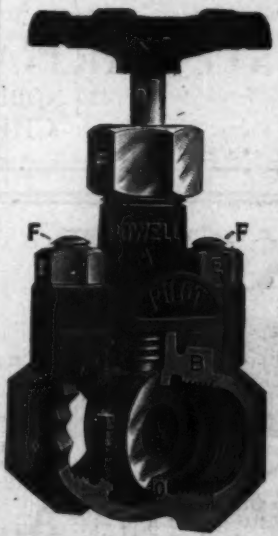
These are handy, time-saving valves on pulp lines, drain lines, and wherever a quick full flow is desired and where the valve must be worked very often.

Valves in bronze, iron, and steel for all requirements of the paper industry. At supply houses everywhere.

JENKINS BROS.
New York Boston Philadelphia Chicago
Montreal London

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

POWELL VALVES
"Pilot" Gate Valves



All iron or iron body with steam bronze trimmings. Simple in construction.

Economical and Reliable

Avoid disappointment in Valve Service by specifying POWELL VALVES

THE WM. POWELL CO.
Cincinnati, Ohio

Write for descriptive Circular

EASTWOOD Wire Mfg. Co.

Fourdrinier Wires
Cylinder and Washer Wires

Belleville, New Jersey
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WE ALSO MANUFACTURE

Valves, Unions, Cocks, Fittings, Digester Parts, Castings, etc., for Sulphite Mills from Our Perfection Bronze

A. D. COOK, Inc.

Lawrenceburg **Indiana**

FIG. NO. 28

Manufacturers of Deep Well Pumps, Working Barrels, Rods, Foot Valves, Strainers and a full line of Water Well Supplies.

The accompanying half tone shows the COOK Patent Brass Tube Well Strainer with Standard Fittings, which are Bail Plug in the bottom and Foot of Blank and Lead Packer on top.

When the COOK Strainer is properly selected for the water bearing sand, capacity and method of pumping, it will successfully deliver the maximum yield of the well for many years free from sand and the troubles incident thereto.

Write for Bulletin 30A

PAINT PROBLEMS
SOLVED

SACOLITE MILL WHITE

PYRAKOTE PAINT

PAINTS FOR PAPER AND PULP MILLS

Explain your troubles to

STEWART-ADAMS & CO.

430 NOBLE STREET
CHICAGO

PAPER AND PULP MILL PAINT SPECIALISTS

Ad-A. Kote Insecticide and Deodorant

See Paper and Pulp Mill Catalogue

WYCKOFF WOOD PIPE

PRESSURE PIPE THAT NEVER BURSTS.
Built in sizes 1 inch to 48 inches.

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

The Pipe of Service

DURABLE—ECONOMICAL—EASY TO INSTALL

Built of selected Canadian White Pine, Wyckoff Wood Pipe is wound with steel bands whose tensile strength is 50,000 to 65,000 lbs. per square inch. The experienced engineer selects a pipe of proven dependability. Wyckoff Wood Pipe, during the past 65 years, has built a reputation that stands the keenest competition. It has been, during this time, the choice of the largest pipe users in the world. We also manufacture a high grade underground steam pipe casing.

Write today for catalog and prices

A. Wyckoff & Son Company

1855 Elmira, N. Y., U. S. A. 1923

are easily soluble, can be used too. In the latter case the addition of magnesia compositions is important.

This method means a great saving of material, time and heat for paper manufacture. The formation of the composition is done in the reaction mass while it is still warm, but even when cold no difficulty is experienced. The tedious neutral boiling with china clay is saved. The clay, containing undissolved raw materials, are utilized as filling stuff for paper manufacture, and are obtained, if becoming solid is prevented, as a kind of mud which is free from acid and sand. In this form they do not spoil the bedplates and engine knives. The existing materials of the reaction mixture for sizing and filling the paper can be freed from all water products by a strainer, and a dissolving of raw alum, sulphurous clay, bitter salt, etc., is saved.

If a rigid state is prevented the clay containing mud is preserved minutely dispersed, it has a great reaction capacity in connection with the thus obtained sulphate solution.

If bi-sulphate is used, the unsolvable residue can be easily removed by one of the usual methods; excessive sulphate of sodium can be separated by crystallizing, and freed from clay by adding lime to its alkali liquid can be obtained in a pure state. The lime can be used for neutralizing the china clay and thus a solution of sodium, alum and soda, having a high percentage of clay can be obtained.

In all cases it is important that you prevent the mixture from getting solid or dry, by diluting with water, and also that you utilize the product in liquid state for paper sizing, purifying of water, etc. If you, for instance, use 100 parts burned china clay of about 23% clay, also 300 parts bisulphate of sodium having 32% mono hydrate for boiling, you must add at least 30 to 40 parts ground magnesite or burned magnesite for neutralizing. Then the reaction mixture while still hot, is to be diluted with water, and the whole liquid is kept in motion and passed through a fine strainer for removing undissolved, sandy portions. The liquid, thus purified is employed together with the suspended filling materials, or after allowing them to set, separated from them for paper sizing. In this case the mud, thus obtained, forms a valuable sizing and filling medium which does not spoil the engine parts.

The boiling and neutralizing proceeds, as we have seen, in one run, viz.; without solidification and this gives far better results. It avoids portions of the reaction product which become more or less undissolvable during solidifying from getting lost. The exploitation is much increased by boiling the clay-containing materials with a great excess of sulphuric acid or bi-sulphate, by which the utilization of the clay capable of reaction is considerably increased when the boiling once takes place. The quantities of basic salt required for neutralization are, however, larger, but the sulphate of magnesium thus produced is of great advantage in connection with clay-sulphate for the sizing of paper.

Austrian Paper Industry Prospering

Since 1919 the Austrian paper industry has been growing constantly stronger and the business is a sizeable one for about two-thirds of the paper mills of Austria-Hungary remained to Austria proper after the division of the old empire, says Consul C. H. Foster in a report to the Department of Commerce.

The completion of the year 1922 shows an increase in exports of wood pulp and cellulose as well as of paper and paper boards, as compared both with the tonnage and value of 1921. The increase in pulp exports continued through the first quarter of 1923, due in part to the strikes in the Scandinavian countries and to the reduced exports from Finland on account of the freezing of the Baltic. Exports of paper and paper boards remained in proportion to the quantities for a similar period of 1922. The export of paper from Austria is hampered by the domestic export tax of two per cent as well as by the lack of commercial treaties. The latter circumstance has enabled foreign countries to practically seal their frontiers to Austrian goods by prohibitory duties and import permits.

Italy, France, Germany, Yugoslavia, Czechoslavia, Switzerland, and Poland were the chief buyers of wood pulp and cellulose while the largest exports of paper, paper boards, and paper manufactures went to Hungary, Italy, Yugoslavia, Germany, Switzerland, and Czechoslavia. It is stated that the factories export from 10 to 40 per cent of their total product direct and obtain, thereby, more than enough foreign currency to pay for necessary imports of coal and auxiliary materials.

The Permutit system of water filters and filtration equipment is fully explained by drawings, photographs and tables, in their new bulletin No. 105.

Starch

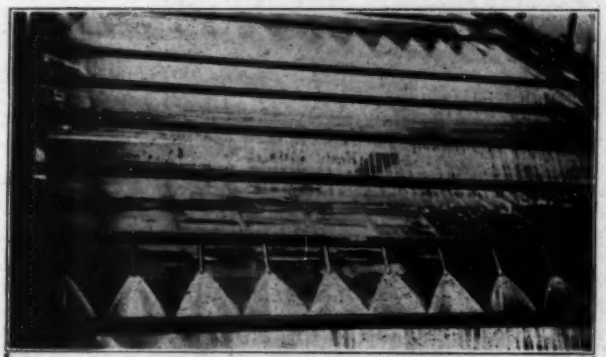
ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

CORN PRODUCTS REFINING COMPANY
17 Battery Place New York

Starch



Mr. Mill Man:

Here is a fan spray for white or fresh water, which covers the entire surface to be cleaned. It is 98% non-clogging on white water. It will give you satisfaction as it is giving others on wires, rotary screens, felts, knotters, tailers, wet machines, incline screens, cylinders, and foam sprays.

In conjunction with the De Zurik White Water Saving System, it saves all the fibers and chemicals in the white water.

Write for complete information.

DE ZURIK NOZZLE SHOWER CO.

White water a specialty.

SARTELL MINN.

DUXBAK
Leather Belting

The Right Belt for Beater Drives

DUXBAK Waterproof belting is not only the right belt for beater drives but is the most economical because of its:

1. Superior power transmitting ability.
2. Large overload capacity.
3. Length of service (proved by past service of 20 to 30 year belts).
4. Salvage value.
5. Cheaper cost per horsepower transmitted per year.
6. Lowest final cost per foot per year.

DUXBAK is extremely pliable and has the gripping power to snugly hug the smallest pulleys running at high speed.

Let our Engineering department help reduce your power transmission cost

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Tanners
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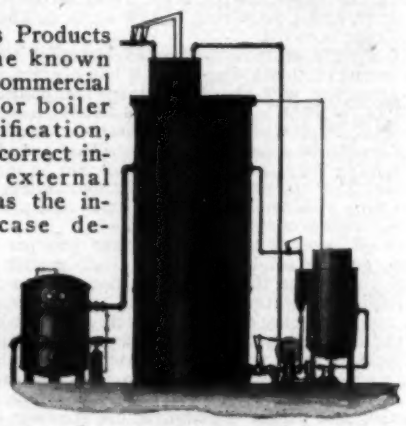
Water Softening and Filtration

Paige-Jones Products include the known successful commercial methods for boiler water purification, permitting correct internal or external treatment as the individual case demands.



Paige-Jones Pressure Filters insure a clean and clear water for all industrial purposes.

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Highly developed equipment and complete Engineering Service covering the following lines:

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Write for bulletins on any air-handling problem that concerns you. We put at your disposal the knowledge acquired through forty successful years.

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BRANCH OFFICES IN ALL PRINCIPAL CITIES

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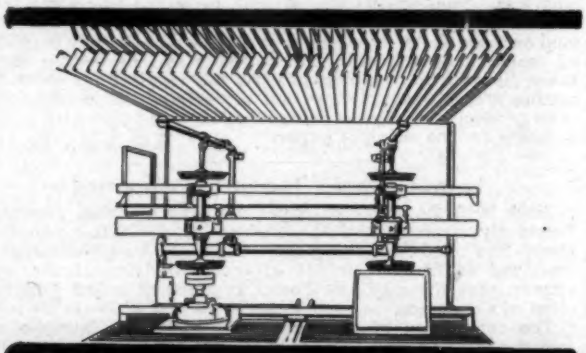
EXHAUSTERS • VENTILATING FANS • AIR WASHERS • BLOWERS • ENGINES FOR HEATING, VENTILATING, DRYING, AIR CONDITIONING, MECHANICAL DRAFT



A Non-Clogging Air Washer with Tandem Atomizer.

The illustration above shows top view of the atomizer chamber of a

Bayley Turbo Air Washer

The four motor operated sprayer discs create a very dense double spray of infinitesimal particles of water, through which air must pass before it enters the room. In this passage through the screen solids, dust, soot and other impurities are removed from the air, leaving it pure and sweet as after shower breezes. As a conditioning unit it will keep temperature and humidity uniform throughout the year, regardless of weather conditions. Unique construction of the atomizers keeps the water spray uniform in density and clogging is entirely eliminated. Especially designed for churches, schools, theatres, food producing establishments, hotels, public and office buildings.

Write for Booklet

BAYLEY MFG. COMPANY, Dept. B Milwaukee, Wis.

It is reported that an agreement has been reached between the city of Fort William, Ontario, Can., and the Great Lakes Pulp and Paper Co., whereby the latter will undertake the erection of a plant within that city to cost not less than $3,000,000, one unit of which, the pulp mill, will cost $800,000, shall be completed and in operation within one year, and the paper mill, to cost $2,200,000, is to be completed and in operation within two years.

The Garden City Paper Mills at St. Catharines, Ontario, are planning to build another paper mill to cost around $400,000. Lorne Gardner is the president of the Garden City mills, and the products of the company include light papers, tissue papers, towels and wax paper. The Canadian Vegetable Parchment Co., located at Merritton, Ont., is an allied company of the Garden City Mills.

The Mattagami Pulp & Paper Company's plant at Smooth Rock Falls, Ont., is reported to have been operating at capacity during the past month, with a production of 4,000 tons of unbleached sulphite. A number of improvements and installation of new equipment are now under way at the mill.

News Personals

Jacob Seibert, widely known in the pulp and paper industry as a pulp salesman, has severed his connection with Price & Pierce, Ltd., pulp importers and mill agents of New York City, and, together with Albert Selbert has formed a new company under the name of Seibert & Selbert to act as mill agents with offices in the Union Trust Building, Cincinnati, O. The new company will be sole selling agent for the Bastrop Pulp and Paper Company, of Bastrop, La., manufacturers of high grade kraft paper. Mr. Selbert was formerly head of the Selbert Paper Company in Cincinnati, and recently has represented the Advance Bag Company, which agency the new firm will retain.

Alfred J. Moran, president of the Waste Merchants' Association of New York, and a director of the National Association of Waste Material Dealers, Inc., has entered business on his own behalf under the name of A. J. Moran & Company, Inc., with offices at 100 Hudson street, New York, where he will continue the paper mill supplies business which he established for E. B. Thomas & Company, Inc., this firm having ceased operations and withdrawn from the trade. Mr. Moran is well known to paper manufacturers as a reliable supplier of raw materials.

Gus Holm, well known in paper stock circles of the metropolitan district, has organized a new concern under the name of the Acme Paper Stock Company, Inc., which has been incorporated under New York State laws with a capital of $15,000 to deal in all grades of waste paper, specializing in the high grades. Offices have been opened in the Tribune Building, 154 Nassau street, New York.

Mr. E. J. Raney, superintendent of the Chicago Mill & Lumber Co., spent two weeks of his vacation at Culver, Ind., with his son, Charles, who is superintendent of the Circleville Straw Board Co., Circleville, Ohio. They stayed at the latter's cottage at Lake Maxinkwekee, which is known for its good fishing. From there Mr. Raney went to Denver, Col., to visit his youngest son, who is connected with the paper business.

Herman W. Ahrens, well known in the paper mill supply trade of New York through his connections with several leading concerns, is now with the Waste Material Trading Corporation, of 135 Broadway, New York, assisting Herbert P. Brock in the papermaking rag department of that firm.

George Burns, of Daniel M. Hicks, Inc., importers of and dealers in paper manufacturers' supplies of 200 Fifth avenue, New York, was married on September 8 to Miss Adelaide Negreira, of Brooklyn, N. Y., and has just returned from a honeymoon trip to Bermuda.

Carl E. Lincoln, formerly sales manager of the American Writing Paper Company, with offices in Holyoke, Mass., has been appointed general manager of the Holden Paper Company in Newburgh, N. Y., manufacturer of book and writing papers with mills in Newburgh and Salisbury, N. Y.

R. J. Wainwright, formerly with the Robert Dollar Company, pulp importers, is now associated with Price & Pierce, Ltd., pulp importers and mill agents of New York City.

No Breaks
No Leaks

Every Caldwell Tank is machine-planed and jointed—properly. The Caldwell Cypress Tank swells just enough to make it virtually a solid piece of wood, thoroughly leak-proof. True, tight and properly braced—there is no possibility for bulges or breaks.

Caldwell Tanks are built by men who have been making superior tanks for over 30 years.

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Caldwell TANKS AND TOWERS

PRATT & CADY VALVES

SINCE 1878

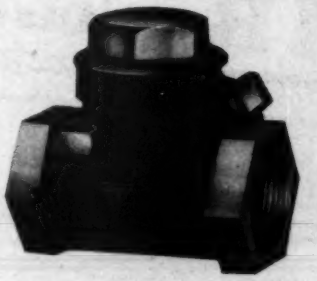


Fig. 201 Bronze Swing Check Valve

The disc can be renewed or reground with the valve in the line

Each Pratt & Cady bronze and iron valve has its own renewable feature which assures a long life in service and keeps maintenance costs low. They are built for all water and steam and oil services where the temperatures do not exceed 500° F.

Reading Steel Casting Co., Inc.

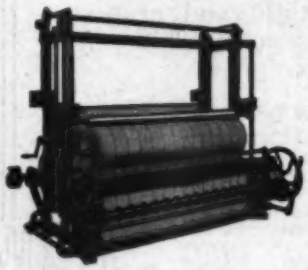
Pratt & Cady Division
General Sales Office: Bridgeport, Conn.
829 Connecticut Avenue
An Associate Company of the American Chain Co., Inc.

IF you are going to build a new mill or overhaul an old one, let our Staff of Engineers and Paper Mill men make some suggestions which will save you on construction and operation.

By using our Ball Bearing CLAFLIN Refiner with renewable Manganese cast steel filling.

Inquiries will receive prompt attention.

THE HERMANN MFG. CO.
LANCASTER, OHIO



"Shear Cut" Slitting and Rewinding Machines

Adj. Rotary Spot Sheet Cutters with Lay-boy cut to register and jog square.

MEISEL PRESS MFG. CO.
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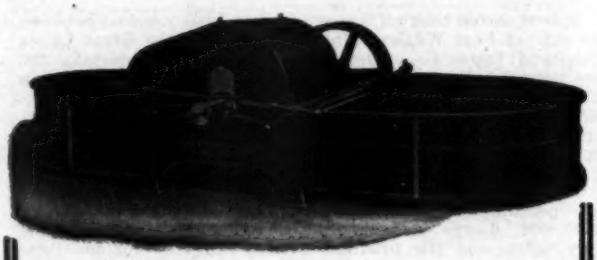


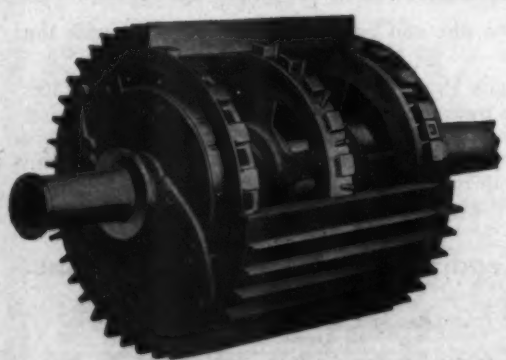
"Dayton" Beating Engines are Built for Heavy Duty

Dayton Beater and Hoist Co.
DAYTON, OHIO

$1000.00
CASH FORFEIT

$1000.00 Cash forfeit that the Stickle system for removing air and Condensation from the dryers and automatic regulation of steam for drying will dry more paper evenly with less steam consumed than any equipment manufactured for the same purpose under a competitive test.

STICKLE STEAM SPECIALTIES CO. **Indianapolis, Ind.**



Dayton Globe Iron Works
DAYTON, O.

We manufacture Beating and Washing Engines, Head Gates, Hoists and Gears.

Our Wedge Type Bandless Roll made of semi-steel with special alloy bars is practically indestructible.

Albert Eckert has severed his connection with the E. J. Keller Company, of New York, to become associated with the George M. Graves Company, Inc., of 77 Summer street, Boston, Mass., importers of and dealers in papermakers' supplies.

D. C. Everest, manager of the Marathon Paper Mills company at Rothschild, Wis., chairman of the Japanese Red Cross fund and through his efforts more than the allotted $2,800 for Marathon county was raised in less than a week.

T. J. Klase, previously connected with the E. J. Keller Company and Isaac Minsky, of New York City, is now serving as traffic manager for Katzenstein & Keene, Inc., importers of paper manufacturers' supplies of 200 Fifth avenue, New York.

The Scandinavian Pulp Agency, Inc., importers of wood pulp, has removed from 50 East Forty-second street to the Canadian Pacific Building, 342 Madison avenue, New York City, where more spacious quarters are occupied.

James R. Carter

Dean of the New England trade, and perhaps the greatest figure in the industry in that part of the country, James Richard Carter, paper manufacturer and merchant, passed away at his summer home at Jefferson, N. H., on Thursday, September 13.

Funeral services were held at the Church of the New Jerusalem, at Newtonville, Mass., on Sunday, the 16th, and the body was cremated at Forest Hills, Boston. Merchants and manufacturers from over New England attended services, which were beautiful and impressive. Both the Boston Paper Trade Association and the New England Paper Merchants' Association were represented by a delegation consisting of their presidents and vice-presidents.

Mr. Carter will be remembered chiefly for his monumental success—the Carter Rice Co. Corp. of Boston, one of the three largest paper merchandising houses in the United States. He was treasurer and chief owner of this company, as well as the house of Carter, Rice & Carpenter, paper merchants of Denver, Colo.

Though chiefly a merchant, his manufacturing activities were important. He was principal owner of the Nashua Gummed & Coated Paper Co. of Nashua, N. H., large makers of gummed papers, and the Carso Paper Co. of Dansville, N. Y., makers of waxing papers. He also controlled the famous Carter's Ink Co. of Cambridge, Mass.

Norma Company Enlarges

The Norma Company of America has placed contracts for the erection of the first unit of its new plant upon its property recently acquired at Stamford, Conn.

This property consists of 17 acres of land facing the main line tracks of the New York, New Haven & Hartford Railroad adjacent to Glenbrook Station, and the buildings now under construction will be of the one story saw-tooth roof type occupying about 60,000 square feet of space. The Company's present plant at Anable Avenue, Long Island City, will be continued for the production of Norma, precision, open type, annular ball bearings.

The Company's Stamford plant will be equipped for the manufacture of Hoffmann precision roller bearings, the American rights to which, as well as to all other Hoffmann products, were recently acquired by the Company from The Hoffmann Manufacturing Co., Ltd., of Chelmsford, Essex, England. The plant will also be equipped for the expansion of the manufacture of Norma precision ball bearings.

First Cellophane Plant Started

The manufacture of cellophane, a transparent, cellulose product, used largely in millinery for decoration and in other trades for wrapping purposes, is to be started in the United States by the duPont Cellophane Company, a subsidiary of the E. I. duPont de Nemours & Company. A plant to cost approximately $2,000,000 is now being constructed on the Niagara River at Buffalo, New York, adjoining the factory of the duPont Fibersilk Company. This will be the first plant to manufacture this product in the United States.

Cellophane has been produced in France for the past several years and its use is extending for wrapping purposes for confectionery, biscuits, cakes, tea, coffee, cocoa, meat products and, in fact, for nearly all articles of food. It is also used for wrapping purposes for perfumery, soap, various toilet preparations, pharmaceutical products and others.

SIMONDS
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Machine Knives for Pulp and Paper Mills
SIMONDS SAW AND STEEL CO.
Fitchburg, Mass. 5 Factories
Chicago, Ill. 12 Branches

PAPER CUTTERS
Single, Duplex, and Diagonal
CUTTER KNIVES
PATENT TOP SLITTERS
Hamblet Machine Co.
LAWRENCE, MASS.

BITUMASTIC

A Coat of Bitumastic Will Rejuvenate Your Plant

THE fine glossy finish of Bitumastic Solution makes a wonderful improvement in the appearance of plant and equipment—to say nothing of its protection against rust and its exceptional durability. Just the thing for stacks, boiler fronts, pipes, tanks, structural steel, metal roofs and buildings and other steel surfaces.

Use Bitumastic now to protect your steel work against the rigors of winter weather.

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322 S. Delaware Ave., Philadelphia

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Cost Association *of the* Paper Industry

Headquarters

18 East 41st Street, New York City

Secretary-Treasurer, Thos. J. Burke, C. A.

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COST SYSTEMS
COMMON SENSE
THEY GO HAND IN HAND

Join this Association and help put your industry on a sound, economic basis by promoting the use of proper cost estimating and cost finding methods.

"Supported by Manufacturers from Maine to California"

Mathieson Alkali Reduces Prices

Following is a letter received from the Mathieson Alkali Works (Inc.) of New York City:

"New York, 27 September, 1923.

"The Mathieson Company is today mailing to all of its customers with whom it has quarterly contracts for carload lots in standard drums, the following letter. Please understand that what is given below is the complete letter without any modifications, going to all its customers:

"'A sincere effort to consider thoroly the changes in the present bleaching powder market, has delayed announcement of prices to apply on the last quarter of your contract until the present moment.

"'It is our opinion that the unreduced cost of manufacture of this commodity, together with the well known effect of cool weather, are already having their effect on the market situation and that the general trend for the rest of the year will be towards the prices applying for the first half of 1923.

"'However, some recognition of the disturbances must be made by us to our contracted customers and for that reason a further reduction from last quarter's price to a figure of One Dollar and Sixty-Five Cents ($1.65) per hundred pounds is announced herewith as applying to deliveries during the last quarter of the year.'

"It will also be the Company's policy to modify to this figure all contracts for carload quantities in standard drums which have been taken without the usual quarterly revision clause.

"The Company also recognizes, and does not refrain from publicly stating that some large contracts for Liquid Chlorine in tank car quantities are still being negotiated for periods of twelve (12) months at under four cents (4c) per pound F. O. B. factory. With regard to the price which would apply on either bleaching powder or liquid chlorine for contracts for delivery over 1924, the Company wishes to state that observation of the market situation for a further period will be necessary before definite figures can be announced.

"It is hoped that bleaching powder will move to a point where there is some margin of profit in its sale and that the price on liquid chlorine will correspondingly strengthen."

Link-Belt Acquires Meese & Gothfried Co.

Charles Piez, President of the Link-Belt Company, Chicago, announces the purchase of the Meese & Gottfried Co., of San Francisco, Los Angeles, Seattle and Portland.

For the past ten years Link-Belt Company has been distributing its products on the West Coast through its subsidiaries, the Link-Belt Northwest Co., of Seattle, and the Link-Belt Pacific Co., of San Francisco. The improvement in distributing facilities effected by the consolidation, and the additional manufacturing facilities acquired, should give the rapidly-growing industries of the Pacific Coast highly economical and efficient service.

The new organization will be known as Link-Belt Meese & Gottfried Co., with headquarters at San Francisco. The officials will be:

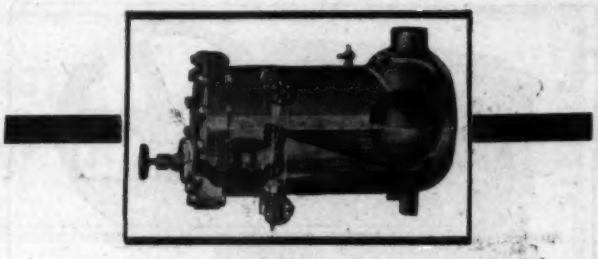
Charles Piez, Chairman of the Board.
B. A. Gayman, President.
Harold H. Clark, Vice-President and Sales Manager.
Leslie W. Shirley, Treasurer.
Richard W. Yerkes, Secretary.

The Link-Belt Company has in its policy of expansion, placed its manufacturing plants and warehouses near its markets, so that users of materials-handling and power transmission equipment may be provided with prompt service at low freight rates.

"Lopulco Pulverized Fuel Systems" is the title of a new catalog offered by the Combustion Engineering Corporation. This is the first publication they have issued that describes both the theory and mechanical features of their powdered coal system. It contains numerous illustrations including a section through a Lopulco equipped boiler plant which shows all the different elements of the system, as well as interesting test data, and information concerning some of their outstanding installations.

A new bulletin published by the Uehling Instrument Company of Paterson, N. J., describes several new devices patented by this company to eliminate soot, moisture and sulphur from their CO_2 recorder.

The Motor Bloc Corporation of Philadelphia, Pa., have published a new bulletin describing their motor driven chain hoist. The bulletin is illustrated with several photos of their chain hoist in operation.



A Davis—

Keeps the Steamline Free of Water

Automatically, the Davis Steam Trap keeps steam lines free of water or condensation, it operates under any pressure—high, medium or low—and discharges continuously against any lower pressure. Operation is reliable—without loss of steam, without trouble and without repairs or adjustments.

The cone-shaped balanced valves give unusually large capacity and will not stick or clog. Valves and seats are made of Tobin bronze—non-corrosive and much harder than steam metal—and are renewable, easily cleaned and can not be injured by foreign material.

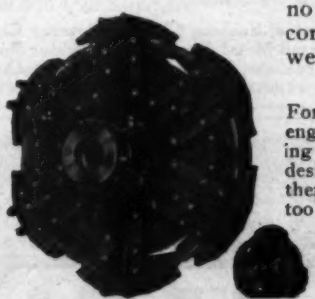
Write the G. M. Davis Company, 420 Milwaukee Ave., Chicago, for your copy of the big catalog.

DAVIS VALVE SPECIALTIES

STEAM SAVERS SINCE 1875

A Powerful Friction Clutch

The vise-like jaws of the Smith Type Hill Clutch insure a grip on the ring that absolutely prevents slipping. When the clutch is disengaged there are no revolving parts in contact — therefore, no wear.



Smith Type Hill Friction Clutches Made in 29 Sizes from 9 H. P. to 1300 H. P. at 100 R. P. M.

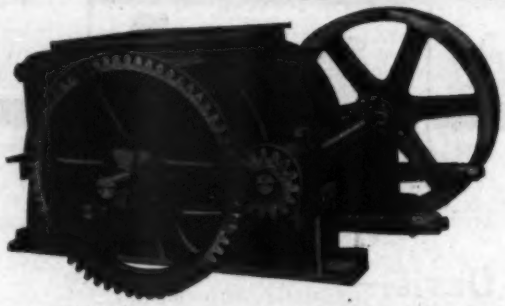
For thirty-nine years our engineers have been studying clutch requirements and designing clutches to meet them. They can help you too in selecting the proper clutches for your mill.

For Pulp and Paper Mills

THE HILL CLUTCH CO.

General Offices and Plant CLEVELAND, OHIO

NEW YORK OFFICE: 50 CHURCH ST.



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will insure a regular supply of properly sized coal for your automatic stokers at a low cost per ton.

They are built in single and double roll types, in capacities to handle 30 to 200 tons per hour.

Shall we send you our catalog showing our various types and sizes of coal crushers?

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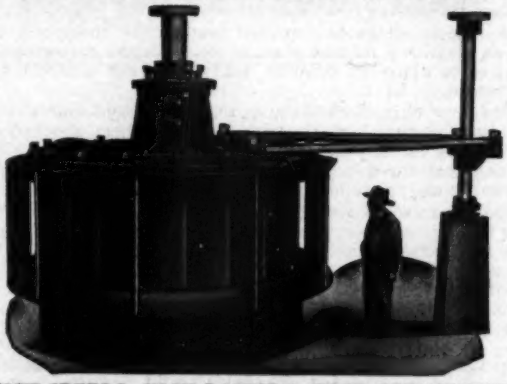
TURBINE WATER WHEELS



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All of our turbines are designed and built to suit location and requirements, by engineers and experts who have had years of experience in this particular line of work. Turbines fully guaranteed.

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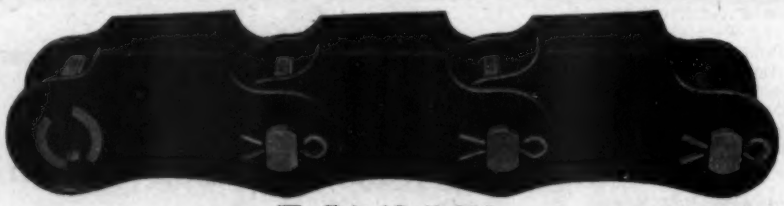
MINNEAPOLIS, MINN.....Plymouth Building
LANCASTER, PA.....Woolworth Building
PETERBOROUGH, ONT., CANADA...William Hamilton Co., Ltd.



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Why Double Life?

When the pins and bushings in Union Steel Chains are considerably worn on the one side they can be turned half a revolution, thus bringing their unworn sides into service and practically renewing the chain; later they can be replaced with new wearing parts at small expense. Union Steel Chains invariably give longer service per dollar of cost; that's why they are used by the leaders in all industries.

UNION STEEL SPROCKET CHAINS

The chains with the substantial links and large case-hardened bearings. All sizes and capacities from one-inch pitch to 1,000,000 pounds ultimate strength.

Roller Chains; Bushing Chains; Elevator Chains; Conveyor Chains; Barking Drum Chains; Monel Metal Chains and Elevator Buckets; Cast Tooth Sprockets; Cut Tooth Sprockets; Renewable Tooth Sprockets; Elevating and Conveying Machinery

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WATER
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

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Eighth Annual Edition of Chemical Catalog

The eighth annual edition of the Chemical Engineering Catalog has just been issued. The binding is of brown Karatol, the same as previous issues, and is stamped in gold. The contents is composed of 1,056 pages and is printed in black ink, on good white paper.

The catalog is arranged in the same style as their previous issue. The first few pages of the book lists the firms whose products are advertised therein. Next comes 188 pages of classified index of equipment and materials. There are 721 pages of catalog matter in the body of the book, all profusely illustrated and arranged in alphabetical order according to firms' names. In these pages, firms have described their products in such a manner that anyone in search of a particular requirement has no trouble in selecting the organizations best suited to supply his needs.

The Technical and Scientific Book Section covers 109 pages of first, a subject index under which are arranged alphabetically the names of all authors who have written books on that particular subject, and second, in the book section proper comes a complete review under each author's name of the books prepared by him. This section has been greatly enlarged from their previous annual catalog, and concludes the book.

The Chemical Engineering Catalog is published under the auspices of a committee authorized by various chemical societies and is leased at $2.00 a year ($3.50 in foreign countries) to all persons or organizations definitely connected with chemical engineering. To all others, a charge of $10.00 a copy is made. The publishers are Chemical Catalog Company, Inc., 19 E. 24th St., New York City.

Book on Chemical Resistance of Engineering Materials

A book that should be of value to every person and firm engaged in using or handling acids and other chemical substances is one just recently published entitled, "The Chemical Resistance of Engineering Materials." The authors of this book are M. L. Hamlin, who is Assistant Professor of Chemistry, and Liggett & Myers Research Fellow, Trinity College, Durham, N. C., and F. M. Turner, Jr., Technical Editor, Chemical Engineering Catalog.

The book contains 268 pages, 6x9 inches, and is attractively bound in cloth. It is composed of the following chapters: Chapter I—Introduction; chapter II—Sulfuric Acid and Metals; chapter III—Other Acids and Metals; chapter IV—Acids and Non-Metallic Materials; chapter V—Bases and Alkaline Salts; chapter VI—Neutral Substances; chapter VII—Selection of Material for Specific Equipment; chapter VIII—Concrete in Chemical Construction; chapter IX—Appendix. Here is listed tables, definitions, physical properties of materials and names of alloys.

The object in compiling this book is three-fold; quoting the author's description of the book in the preface, three reasons are given for presenting this work—(a) to present the results of experiment and of general knowledge in a full but not necessarily exhaustive way, and wherever possible to give quantitative data; (b) to serve as a bibliography of the subject by referring to all the sources used; (c) to stimulate further research and publication along this line by showing what parts of the field are incompletely covered, and by suggesting ways of making results more generally comparable and hence more practically useful.

This book is published by the Chemical Catalog Company, Inc., of New York City. The net price is five dollars.

Co-operative Technical Service

The Technical Association of the Pulp and Paper Industry has instituted a system of technical service for its individual and corporate members.

When a member desires information on a technical or manufacturing problem the inquiry is presented to the secretary who passes it, in blank, with a copy of his preliminary reply, to the other members.

When the returns have been received a transcript of the inquiry with the replies, in blank, are distributed to the corporate members and to those of the individual members who have responded to the inquiry.

By submitting them in blank the identity of the inquirer and those who have responded is not disclosed.

The number and character of the responses and the expressions of appreciation of the inquirers are evidences of the general favor with which the plan is regarded.

Raising Steam Pressure

The question of raising sufficient steam pressure from a small steam-power station has been settled by a German firm, who has designed a boiler that will generate 15,500 pounds of steam an hour.

The steam-power plant where this boiler is to be used is designed to carry a gauge pressure of about 850 pounds per sq. in. at the engine throttle. The 850 h.p. engine will operate with a back pressure of 140 pounds and drive an air compressor. The exhaust steam will flow into a heat accumulator, which will supply the steam hammers of the shop.

WANTED

Experienced dyestuff salesman to call on Paper Trade in Middle West. Must know colors and their application. Good opportunity for right man with manufacturers and importers. **Address Box 58, The Paper Industry.**

WANTED Early in October—Experienced **Machine Tenders, Beatermen, Back Tenders** and **Second Hands** for new high grade tissue mill (Fourdrinier machine) in Canada. Pleasant location in small town. Married men with working families preferred. Good housing accommodation and moderate living costs. Vacancies also for **Cutterman, Calenderman** and **Finisher.** Excellent opening for first-class men. Apply, giving full particulars of experience, references and stating wage expected to Box 57. THE PAPER INDUSTRY.

Pickles' Patent
Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

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TICONDEROGA, N. Y., U. S. A.
MANUFACTURERS OF
WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control
(PATENTED)
WARREN IMPROVED PATENT DOUBLE DRUM WINDERS
Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties
SEND FOR OUR BULLETIN

STURTEVANT DRYING SYSTEMS

You can remove damp steam as it forms; prevent roof drips; dry sheets evenly; reduce felt and press roll crowning bills; and increase production and profit by installing a Sturtevant System.

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Complete Pulp & Paper Mills, Investigation of New Enterprises, Special Heat & Power Applications, Hydro-Electric Developments, Steam-Electric Power Systems, Sectionalized Paper Machine Drives.

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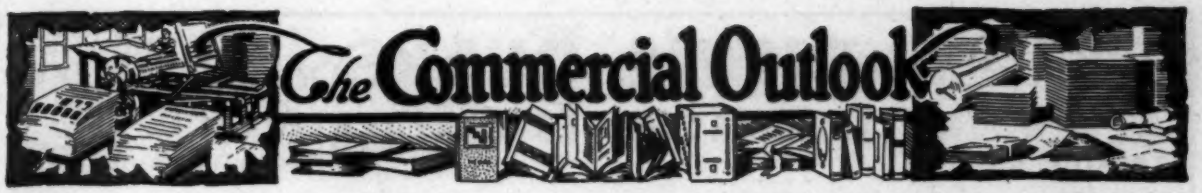

New York, October 1, 1923.

THERE is no question but that some branches of the paper industry are enjoying pronounced activity at the present time. On the other hand, certain descriptions of paper are in relatively slower demand, and mills making such grades could very easily accommodate additional business. Viewed in its entirety, the market is comparatively broad for this time of the year, although buying of some kinds of paper is still rather of spotty character and lacks the volume that the trade had expected would be encountered at this season.

Consumers of paper continue to operate as purchasers on a decidedly reserved scale. In some consuming fields activity has increased at a rate where consumers are using more paper and therefore are expanding their buying to keep pace with their growing requirements. Generally speaking, however, demand is developing somewhat slowly, reflecting the indisposition of consumers to absorb other than supplies actually and directly needed. The result is that some paper mills are on the lookout for additional orders, and, in an effort to corral as much of the pending business as they possibly can, some shading of prices is being resorted to. This is not a common condition but it is in sufficient evidence in certain parts of the trade to make for an unsettled price position.

The outlook for the paper industry is certainly bright. Business generally is exceedingly healthy in tone and is showing steady though gradual improvement. Those industries usually reckoned as the largest consumers of paper of different kinds are mostly characterized by as much activity as any other lines, and since it is admitted that purchasing of paper has been done in a careful manner and almost exclusively against immediate needs, there seems every reason to look for a continued good demand of gradually broadening scope during the next several months. Many in the paper trade expect October and November to prove to be the banner months of the year as regards the volume of business accomplished. The usual fall stimulation of business generally is commencing to be felt, and it is believed users of paper will be actively in the market as buyers in the next few weeks because of increasing need for supplies. Jobbers generally acknowledge that they are carrying smaller stocks of paper than ordinarily; in fact, jobbers are keeping stocks down to the bone in a great many cases, and it is therefore felt that any increase in demand from consuming quarters will be noted by paper manufacturers almost at once became jobbers will necessarily have to go direct to mills for the paper needed to cover their commitments.

There are other bullish factors in the situation as it now shapes up. Advertising is increasing by leaps and bounds, so to speak, not only in the daily press but in fiction magazines and trade periodicals,while a great many commercial concerns are conducting advertising campaigns of various kinds by mail. All of this means large consumption of paper of nearly every grade. Retail business all over the country is reported good and expanding. Merchants are looking forward to and are planning for a record-breaking pre-holiday trade in November and December. The number of merchandise buyers in New York during the early fall season just closed outstripped all previous years, and it is an established fact that they bought in heavier volume than ever before. This means tremendous amounts of paper will be used in retailing establishments throughout the country.

Two branches of the industry are enjoying market conditions of very satisfactory character. They are the building paper and bag paper divisions of the industry. Building papers, especially sheathing and roofing felt, have been consumed in large volume this summer owing to the big building movement all over the United States, and present prospects are building activity will continue until cold weather sets in. The earthquake in Japan is likely to be a considerable factor in this branch of the industry. Japan needs thousands of tons of all descriptions of building materials, building papers and felt included, and that stricken country will look to America to supply her with these materials for the restoration of the destroyed cities and villages. Moreover, the consumption of building papers has been so heavy thus far this year that stocks have doubtless been severely diminished, and manufacturers will probably be kept busy for quite some time replenishing the holdings of jobbers and builders.

Demand for bag papers has shown marked growth recently. This is due principally to the increased use of paper sacks in place of cloth bags because of the high prices prevailing on the latter. Cotton and cotton goods values are extremely high at present and seem likely to remain on current levels, if they don't go higher, as the crop of the staple in the South promises to be substantially smaller than was anticipated early in the growing season. Burlap prices are advancing also, and prices of both cotton and jute sacks are at levels where it pays consumers to substitute paper bags, and that is what they are doing in a great many cases.

The news print situation is firm. Pressmen on the New York newspapers went on strike on September 17 and it looked for a time as if the inability of publishers in the metropolitan area to print their normal-sized issues was going to prove to be an unfavorable factor in news print, but fortunately the strike lasted but two weeks and publishers succeeded in printing issues of reduced size every day, so that the loss in print paper consumption was not enough to affect the market.

Publishers in other cities are consuming news print on a heavy scale. So great is the demand for advertising space in the daily press that numerous papers are announcing almost every day the omission of advertisements, which means they are conserving the tonnage of paper they have under contract and are limiting the size of their issues to conform with the amounts of news print being received from mills.

Book papers are in fairly active demand. There are some mills, however, who could readily accommodate more business, and salesmen have been sent out with instructions to bring in orders so that quoted prices are being shaded in certain instances by manufacturers anxious to land additional business. Machine finished book is quoted at 6.50 to 7 cents a pound f. o. b. New York, with some of the better quality lines quoted at higher prices, while coated book paper is quoted from 8 cents a pound upward.

Fine papers are moving in increasing volume and at stiffening prices. There has been some reduction in quotations on sulphite bonds, owing to the cut in prices of bleached sulphite pulp, but rag bonds and ledgers incline upward.

Coarse papers are moderately active. In spite of the Government ruling that kraft wrapping paper is not being "dumped" into the United States by Norwegian manufacturers, domestic producers are securing enough business in kraft paper to keep them passably busy, and demand is gradually widening as merchants throughout the country lay in supplies for the pre-holiday trade. Tissues are firm in price and in steady demand.

Box boards are only in medium demand in the East and competition among mills for orders is keen. There is, however, much more activity in boards in the West, and reports state that mills there are operating at larger capacity than in this part of the country. Quotations continue well stabilized at about $60 a ton f. o. b. New York for plain chip and $62.50 for filled news, though some mills are accepting orders for news at the same price as chip, while it was reported today that one of the largest manufacturers in the East had reduced prices on both news and chip to $55 a ton New York, though this is understod to be only for a limited tonnage.

Raincoats of Waterproof Paper

Plans have been announced by a Richmond, Va. firm for the manufacture of raincoats from paper to retail at 25 cents each. The garments are to be made from waterproof paper in only four sizes—men's 46, women's 36, and the other two for misses and children. A capelike arrangement will obviate the necessity for sleeves and there will be no distinction in styles between the sexes. All garments will be gray. They will be packed in sealed envelopes, 5x7 inches, thereby making it possible to carry the raincoat in the pocket.

According to the manufacturer, the coats have been tried out in a rainy-spell and found to weather the elements most satisfactorily. The initial capacity of the manufacturing plant will be 1,000 garments a day, the output to be increased with an expected rising demand.

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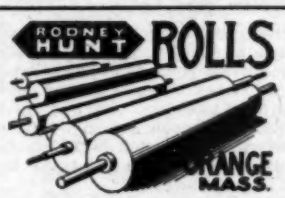

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Papermaking Rags

The papermaking rag market is characterized by a fairly firm undertone. No broad changes in prices have occurred in the past several weeks, but quotations are very steady on practically all grades and the tendency is in a higher direction. This is not unusual for this time of the year. The fall and early winter ordinarily witnesses a firm market for rags since demand from consuming quarters usually increases and since dealers hold stocks with a good deal of firmness owing to incoming supplies from collection sources dropping off.

There are several rather bullish factors affecting the market. One of these is the high level of cotton prices, which has considerable influence on the various descriptions of new cotton cuttings used by paper mills. Dealers handling cuttings say that with raw cotton up around 30 cents a pound, cotton goods of all kinds are proportionately high, and clothing manufacturers naturally insist on receiving higher prices for their rags, feeling that if cotton cloths are so costly the clippings from same should be worth relatively more. The result is, it is stated, new rags are higher priced at primary sources, and dealers consequently are obliged to obtain more money for cuttings when sold to paper mills. Another factor in this connection is that with cotton abnormally high in price, the consumption of and demand for cotton shoddy is increasing at a rapid rate, so that considerable quantities of rags which otherwise would find their way to paper mills are being used up in the manufacture of shoddy, and this competition naturally aids in strengthening prices.

Paper manufacturers at present are purchasing rag stock in a reserved manner. Few are placing orders for other than supplies directly required, and indications are mills are carrying less than average stocks of rags. There seems to be less danger of any scarcity of papermaking rags developing during the remainder of the year than there appeared to be a few weeks ago. For a period of several months in the summer importations of rags dropped off to a marked degree, the reason being that demand in the United States was slow and prices prevailing here were below a parity with the unusually high quotations named by European dealers, who apparently had limited amounts of rags on hand and who could afford to be independent regarding prices because of heavy sales to America early in the year and the development of larger consumption of rags in European countries. Within the past month or six weeks, however, importations of rags into the U. S. have shown a pronounced increase. During August almost a dozen of the leading import concerns in the rag trade in New York sent representatives across the Atlantic, and judging from the arrivals of rags recently, these buyers purchased large quantities of material while in Europe. With these additional big supplies available to paper mills and with domestic supplies holding up fairly well it would appear as if there will be plenty of rags to cover the requirements of consumers over the next several months, although temporary jumps in prices caused by spurts of demand for different grades are just as likely to occur as not.

There seems little question but that consumption of rags, particularly the low grades, in the United States has been heavy thus far this year. The building boom all over the country has led to a tremendous consumption of building papers, especially sheathing and roofing felt, and the principal content of these papers is rag stock of low quality. Roofing paper mills have operated on a basis close to capacity and have chewed up exceptionally large amounts of rags, and the steady and fairly heavy movement of such rags has tended to keep the market for other grades firm even though the latter have not been wanted in anything like the proportionate volume of the low grades.

New cuttings are held with much firmness by dealers, who are expecting demand from fine paper manufacturers to increase substantially during October and November because of the season when this branch of the paper industry is usually active and because this class of mills has done little important buying of rags for quite some time. No. 1 white shirt cuttings are quoted at 12.50 cents a pound or higher, some dealers asking 13 cents at shipping points, while new unbleached muslins are quoted at 11.25 cents per pound, fancy shirt cuttings at 6 cents, washables at 5 cents, new blue overall cuttings at 8 cents, and new light silesias at 8 cents.

Old white rags have advanced slightly. For extra quality No. 1 repacked whites dealers quote 8 cents a pound at shipping points, and even higher in some cases, while No. 2 repacked whites are quoted at around 4.50 cents, and street soiled whites at 2.75 to 3 cents a pound. Thirds and blues are firm at about 3 cents f.o.b. dealers' points for repacked, and between 2.25 and 2.50 cents for rough packing.

Roofing rags are quoted in the East at 1.50 to 1.60 cents a pound f.o.b. New York for No. 1 stock, and 1.35 to 1.40 cents for No. 2 grade, while in the West dealers report they are securing slightly in excess of these prices in some sales.

In foreign rags, dark colored cottons are bringing around 1.50 cents a pound ex dock New York in sales to felt paper mills, and there is a steady demand for blue cottons and linen rags. Dealers recently returned from Europe say that old linens are virtually unobtainable there though some supply of new linens is offered.

Average quotations f. o. b. shipping points and ex dock are:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	12.50-13.00
White shirt cuttings, No. 2	6.25- 6.50
Fancy shirt cuttings	6.00- 6.25
Washables, No. 1	5.00- 5.25
Unbleached muslins	11.25-11.50
White lawns	11.00-11.25
Overall cuttings, blue	8.00- 8.25
Black silesias	4.75- 5.00
Light flannelettes	10.00-10.25
Canton flannels, bleached	10.75-11.00
Canton flannels, unbleached	9.75-10.00
Shoe cuttings, bleached	9.50- 9.75
Shoe cuttings, unbleached	8.00- 8.25
Light silesias	8.00- 8.25
O. D. khaki cuttings	4.25- 4.50
Mixed khaki cuttings	3.75- 4.00
Corduroy cuttings	3.75- 4.00
Cottonade cuttings	3.75- 4.00
Linens, No. 1 white, foreign	14.50-15.50
Light prints, foreign	5.25- 5.50
Old Stock—	
Whites, No. 1, repacked	7.00- 8.00
Whites, No. 2, repacked	4.25- 4.75
Whites, house soiled	3.00- 3.25
Whites, street soiled	2.75- 3.00
Lace curtains	3.75- 4.00
Thirds and blues, rough	2.25- 2.50
Thirds and blues, repacked	2.75- 3.25
Black stockings	3.00- 3.25
Cotton canvas, No. 1	4.00- 4.25
White cotton batting	5.50- 6.00
Roofing, No. 1	1.50- 1.65
Roofing, No. 2	1.35- 1.50
Dark colored cottons, foreign	1.50- 1.60
Blue linens, foreign	4.00- 4.50
Gray linens, foreign	6.00- 6.50
White linens, foreign	10.00-10.50
Light prints, foreign	3.00- 3.25

Rope and Bagging

There is a steady demand for old rope and prices exhibit firmness, yet paper manufacturers are buying in a reserved way and quotations are in a more or less stationary position. In other words, the demand is not broad enough to have strengthening influence on values, whereas there is sufficient buying, coupled with what appears to be limited available supplies of old rope, to fully maintain prices on existing levels. Domestic manila rope in No. 1 dry condition is selling at around 5.25 cents a pound f. o. b. dealers' shipping points. Now and then a sale at slightly under this figure is reported, and, on the other hand, dealers say in some cases they are securing a little better than 5.25 cents from paper mills, but that price is representative of the market value of old manila rope at the moment. Foreign manila rope is selling at 5 to 5.25 cents a pound ex dock New York, and importers assert

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that the prices ruling in Europe make it difficult for them to bring in much supply at a profit.

Old bagging is quiet. Tissue and manila paper mills are buying in a sparse manner, and roofing felt manufacturers are absorbing but limited quantities of bagging. Supplies are ample to cover the wants of buyers, who are generally securing the stock desired at very nearly their own prices. No. 1 scrap bagging is quoted at 1.15 to 1.25 cents a pound at dealers' shipping points, roofing bagging at 90 cents a hundred pounds, and No. 1 domestic gunny at 1.25 cents per pound.

F. o. b. shipping point quotations are:

	New York and Chicago
Gunny, No. 1 domestic	1.25-1.35
Gunny, No. 1 foreign	1.15-1.25
Scrap bagging, No. 1	1.15-1.25
Roofing bagging	.90-1.00
Wool tares, heavy	1.50-1.65
Wool tares, light	1.40-1.50
Manila rope, No. 1, foregin	5.00-5.25
Manila rope, No. 1, domestic	5.25-5.50
Sisal strings	2.15-2.35
Mixed strings	1.25-1.50

Old Paper

Low grades of old paper have shown a rising price trend, and some advance has been noted, whereas the higher qualities have inclined to sag in value and are now to be secured by consuming mills at recessions from the market levels prevailing a short while ago. Probably the feature of the market has been the spurt in prices of old folded newspapers. This was due largely to the strike of newspaper pressmen in New York during the last two weeks of September, which eliminated the usual large supply of old newspapers obtained by mills from that city, and which brought board manufacturers actively into the market to purchase this grade of old paper. Flat folded news advanced to 1.25 cents a pound f. o. b. New York, and at this writing prices range from this figure down to 1.20 cents f. o. b. New York, with western shippers securing slightly higher prices than these in some cases. No. 1 mixed paper is steady in price at 85 to 95 cents a hundred pounds at dealers' points, and board mills in the West are exceeding these rates in some instances.

The decline in sulphite pulp has affected the better grades of waste paper and prices of the latter have eased to some extent. For instance, hard white shavings of No. 1 quality are selling at 4.15 to 4.25 cents a pound f. o. b. shipping points, and No. 1 soft white shavings at 3.15 to 3.30 cents. Old magazines are rather firm at a price range of 1.85 to 2 cents per pound at dealers' points, and ledger stock holds its own at 2.10 cents. The scarcity of ground wood has induced a good demand for white blank news cuttings and sales of this grade at 2.25 cents a pound at shipping points have been recorded.

F. o. b. shipping point quotations are:

	New York and Chicago
Hard white shavings, No. 1	4.15-4.40
Hard white shavings, No. 2	3.50-3.75
Soft white shavings	3.15-3.30
Colored shavings	1.90-2.00
Heavy book, No. 1	1.85-2.00
Crumpled book, No. 1	1.60-1.75
Ledger stock	2.10-2.25
Kraft, No. 1	2.25-2.35
Manilas, No. 1	1.20-1.40
White blank news	2.20-2.30
Over-issue news, No. 1	1.40-1.50
Folded news	1.20-1.30
Mill wrappers	1.00-1.10
Boxboard cuttings	.95-1.00
Mixed paper, No. 1	.85- .95
Common paper	.50- .60

Chemical Pulp

The outstanding development in the domestic chemical wood pulp market has been a reduction in bleached sulphite prices. The foremost manufacturer of this kind of pulp in the United States several weeks ago announced a cut of $10 a ton or half a cent per pound, bringing prices down from 5 cents per pound for the extra quality and 4.50 cents a pound at pulp mills for the ordinary grade of bleached sulphite to 4.50 cents for the first named quality and 4 cents for the other brand of pulp. This reduction was expected in some quarters of the trade and unexpected in others. Many had realized that bleached sulphite was quoted at prices beyond a parity with unbleached sulphite, and had looked for a drop in quotations, yet others had concluded that producers of bleached sulphite, probably figuring that lower prices would not stimulate de-

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mand, would maintain quotations for the remainder of the year.

The reduction in bleached sulphite prices, according to all accounts, has led to increased business in this kind of pulp. Paper manufacturers have bought with more freedom and in larger tonnage although the market cannot be described as other than normally active.

Unbleached sulphite is meeting with a fair sale in moderately large amounts but prices on this kind of pulp have eased slightly. Where some producers were quoting 3.25 cents a pound at pulp mills a month ago, today they are accepting orders at 3 cents. News grade sulphite is selling at 3 to 3.15 cents a pound at producing mills, depending on the quality and tonnage concerned. Kraft pulp is quoted at about previous levels although weakness has developed in foreign kraft. Domestic manufacturers and those in Canada quote between 3.25 and 3.50 cents a pound at pulp mills for No. 1 kraft. Bleached soda pulp holds its own in price at about 3.75 cents at producing plants though some sales of stored soda pulp at a little under this price have been made.

F. o. b. pulp mill quotations are as follows:

Bleached sulphite	4.00-4.50
Easy bleaching sulphite	3.35-3.50
Unbleached sulphite, No. 1	3.00-3.25
News grade sulphite	3.00-3.15
Soda pulp, bleached	3.75-4.00
Mitscherlich, unbleached	3.40-3.60
Kraft, No. 1	3.25-3.50
Screenings, refined	1.75-2.00

Mechanical Pulp

Mechanical pulp continues in a strong market position notwithstanding reports that water conditions in some grinding districts have improved and enabled grinders to increase their production at least to some extent. Demand is brisk, and proof is not wanting that consumers are experiencing difficulty in locating all the supply of ground wood which they would like to have, this of course being the result of low water in mill streams during the past few weeks and the consequent falling off of production. Grinders in New York State and in Wisconsin are in numerous cases seeking to buy ground wood for their own use instead of having a surplus of pulp to dispose of in the open market. In fact, very little domestic ground wood has been available, and buyers have looked to Canada to secure supplies. Grinders across the border have freely obtained $45 to $50 a ton f. o. b. pulp mills for spruce ground wood of prime quality for prompt shipment, and these prices still prevail, with a majority of sellers asking figures close to $50 per ton. Nominal prices on domestic ground wood are $40 to $43 a ton at pulp plants, these prices being lower than Canadian quotations because domestic ground wood is sold containing more moisture and therefore costs more to ship from producing to consuming points.

Members of the trade contend that prices are likely to hold firm for a considerable period even though water conditions may signally improve, owing to grinders being so well sold ahead. Most producers, it is stated, have their normal output for at least a month sold on orders, and the market displays signs of being able to absorb additional supplies were they available.

Prices have worked up to levels where importers of ground wood from Scandinavian sources are able to compete, and sales of imported ground wood at around $47 a ton ex dock New York and other American Atlantic ports have been reported.

Chemicals

Papermaking chemicals are in fair demand and are moving in a steady manner, both against contracts and current orders. Prices are characterized by routine fluctuations, with no broad changes noted. Casein is quoted at about 15 to 16 cents a pound, with duty paid on the imported product. One of the leading factors has announced quotations of 1.45 cents a pound for 58 per cent light soda ash, and 3.165 cents per pound on 76 per cent solid caustic soda in drums to apply to cotnracts for 1924. Both of these products are selling slightly higher for spot delivery. Bleaching powder is quotably steady at 1.50 to 1.60 cents a pound in domestic drums.

Average quotations are as follows:

Alum, lump ammonia	3.25- 3.50
Alum, lump starch	3.75- 4.00
Blanc fixe, powdered	4.00- 4.25
Bleaching powder	1.50- 1.60
Brimstone (long ton, at mine)	18.00-20.00
Casein (duty paid)	15.00-16.00
Caustic soda, spot delivery	3.20- 3.30
China clay, domestic washed	12.00-15.00

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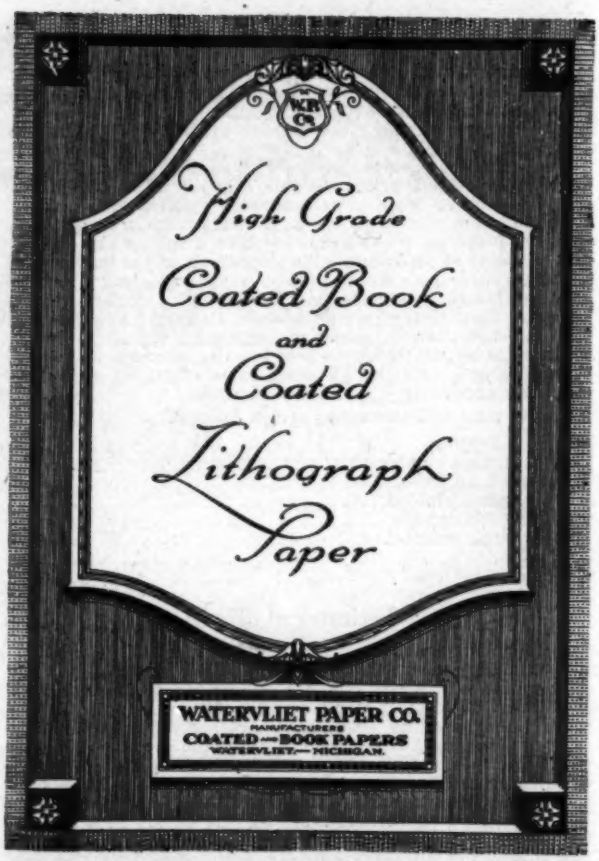

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Starch, papermakers', in bags	2.80- ....
Talc (ton)	14.00-16.00

Final Hearing on Casein Controversy

A campaign of a year and a half against the imposition of a heavy duty on casein, carried on by a special committee of coated paper manufacturers under the aggressive leadership of Martin Cantine of the Martin Cantine Paper Company of Saugerties, N. Y., culminated on Tuesday, September 25, with a final hearing of the casein situation before the United States Tariff Commission.

No intimation was given of the recommendation that will be made by the Commission, but the showing evidence presented by the paper men was so strongly presented, and so well reviewed by Henry A. Wise, attorney for the American Paper and Pulp Association, representing the paper manufacturers that there is little doubt that the appeal for a reduction of the duty on casein will be granted unless political consideration intervene. President Coolidge has intimated that extensive changes in the original tariff schedule are not desirable, and this may prevent the paper men from winning their argument, in which they were opposed by the agricultural group.

The paper manufacturers in their presentation showed that following the imposition of a 2½ cent per pound duty the price rose from 10 cents to 30, and that this means the adding of a cost of about 2 cents a pound to the cost of producing coated paper. Notwithstanding this great increase in the cost of production, the prices had not been increased to meet the increased cost, because such an increase would force coated paper out of the market in competition with uncoated papers which publishers do not wish to use. The paper manufacturers have not passed the increased cost on to the consumers, it was shown, while the profit to domestic casein manufacturers under the tariff was about 150 percent, based on their own figures as to the cost of skim milk.

The protest to the Tariff Commission was based on the plea that the cutting of the duty to 1¼ cents would only slightly reduce this great profit to the dairy interests, while making the difference in the cost of producing coated paper which would enable this grade of paper to compete with the uncoated papers.

The appearance of the coated paper men before the Tariff Commission, however, was of greater importance than the problem of a single group, for in the course of evidence and arguments a mass of testimony was introduced which gave the Commission a clear picture of the problems of the entire paper industry, which cannot fail to be of value in giving the paper manufacturers consideration in future discussion of tariff problems involving the paper industry.

In making this fight Mr. Cantine has come to an important place in the industry. A year and a half ago when the committee of five representing practically all the coated paper manufacturers in the United States was formed, Mr. Cantine had never been prominent in tariff problems. The coated paper problem, however, threw him into the forefront of the entire group of paper manufacturers who were working on the entire tariff problem, and during the fight which preceded the enactment of the tariff bill of 1922 he was able to wield unexpected influence in behalf of the entire paper schedule, not alone the coated paper items, and the casein situation. Only a last minute political trade prevented the placing of casein on the free list where it had always been, and as it was the original proposal to fix the casein duty at 4 cents was defeated.

Since that time he has led the move of the coated paper men to have the Tariff Commission reduce the duty under the flexible tariff provision of the McCumber-Fordney bill. Other members of the committee which have been carrying forward the fight were Charles A. Gordon of the Oxford Paper Company, Walter D. Randall, of the Champion Coated Paper Company, also vice president of the American Paper and Pulp Association, Charles F. Shirley of the Forbes Lithograph Company of Boston, and Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Association.

Important testimony bearing on the imports of casein from Argentina was given by Henry A. Derby, president of the Kalbfleisch Corporation, whose intimate knowledge of foreign conditions was of great value to the coated paper men. The plywood manufacturers, who are next to the paper manufacturers the largest users of casein, were represented by Lawrence Ottinger, appearing for the National Veneer & Panel Association.

Hardwood Pulp by Sulphite Process Perfected

The Newton Falls Paper Company, located at Newton Falls, which is owned by the McGraw-Hill publishing interests of New York, has taken an epochal forward step in paper making by the perfection of a process for the manufacture of the highest grades of book and catalog paper from hard wood, using sulphite. Credit for the discovery, which is the result of months of intensive study, must be given to W. D. Gregor, vice-president and general manager; Wesley Osborne, chief chemist; and Alex Kunzur, sulphite expert at the plant.

Book, bond, ledger, offset and cover paper are the varieties now being turned out by the company from hard wood. The woods most used to date have been beech, maple and birch, but the officials of the company believe other sorts of hard wood can be used equally well.

The Newton Falls company has an abundance of hardwood timber land, with a supply of standing timber large enough to enable the mill to run for 75 or 100 years, it is estimated.

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EXPORTS

The month of July witnessed a decline in the United States' paper exports, which were lower in that month than at any time since February last, according to statistics announced by the Department of Commerce in Washington, the July figures being the last available on exportations of paper. Compared with July, 1922, however, exports in July of this year more than held their own, and, with the exception of news print, wrapping papers and a few minor items, showed fairly substantial increases, paper exports as a whole reaching a value of $2,079,267 in July, contrasted with $1,994,165 in July a year ago, and $2,434,313 in June, 1923.

Shipments of news print, after the rally noticeable in June, were again on the down grade in July, exports in the latter month being lower than in any previous month of this year and also lower than during July of 1922. Wrapping paper and paper and straw board exports also were less than in June, but shipments of the latter item were still ahead of those for July of last year.

The less important items of the paper schedule also showed a general downward tendency although a few of the items, such as surface-coated, tissue, toilet, cigarette, photographic papers and wall board, exceeded the exports of June, in some cases by a fairly substantial margin.

Exports of the chief paper items from the United States during July, 1923, as compared with the preceding month and with July, 1922, are shown in the following table:

	July, 1922		June, 1923.		July, 1923.	
Items	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Newsprint	4,277,144	$ 190,527	3,304,376	$ 167,336	1,959,981	$ 102,561
Book paper, not coated	3,068,183	288,461	2,865,195	311,083	3,010,650	326,817
Wrapping, including kraft	3,160,989	194,266	2,725,931	225,007	2,109,518	165,187
Paper board and strawboard .	4,047,641	164,215	6,418,800	301,416	4,991,225	227,060
All other	.....	1,156,696	.....	1,429,471	.....	1,157,642
Total.....	.....	$1,994,165	.....	$2,434,313	.....	$2,079,267

The Department of Commerce announces that statistics on exports of paper are based on the customs declaration form filed by the exporter or forwarder. In many cases these are carelessly made out, often resulting in the shipments being wrongly classified. Most export houses are vitally interested in these statistics, as they are used as a barometer indicating the trend of business, and if this interest can be extended toward bringing about closer co-operation, by carefully and accurately describing the merchandise on the export declaration form, the statistics as published by the Department will be just that much more valuable. When filing these forms, foreign freight and customhouse declarations should not be used. Shipments should be given their proper trade classifications.

IMPORTS

Wood Pulp

There has been a decided easing in the market for imported wood pulp. Due to several causes, the most important of which seemed to be the creating of a surplus of some kinds of foreign pulp in the American market, prices have sagged and are now on lower levels than have obtained since early in the year. Kraft pulp especially has been in a soft market position. The fact that some importers, and in at least several cases board mills also, purchased kraft in Sweden in larger tonnage than they have had need for, and that as this pulp arrived in the United States it was placed in store to wait a market, when it became necessary because of financial reasons or otherwise for holders to dispose of such stocks some selling pressure was exerted on the market and prices gradually slid off. The easiness in prices moreover prompted consumers to hold aloof as buyers, and this added to the price weakness.

Sulphite also has declined but not as sharply as kraft pulp. The movement of sulphite, both bleached and unbleached, has kept up in better tonnage, and, according to reports, no great amount of sulphite is held unsold by importers and dealers. The sagging of prices in the American market has occurred in the face of a firm situation in pulp in Europe. Scandinavian producers continue to quote about the same prices as have ruled for sometime, and are not falling over themselves to market pulp in the U. S., evidently encountering a good demand from paper mills in England and elsewhere in Europe. In fact, reliable reports state that pulp manufacturers in Sweden and Norway are sold up to by far a greater extent than they usually are at this time of the year. Some mills are said to have practically no tonnage to dispose of during the balance of this year, while nearly all the Scandinavian producers have the bulk of their output between now and the end of 1923 under contract.

Many in the pulp trade are of the opinion that there will be a reaction upward in prices within the next few weeks or when paper manufacturers come into the market to buy pulp for last open water shipment from Sweden. It will be found, it is asserted, that but limited amounts of pulp are available on the other side of the Atlantic, and despite the fact that most consumers in the U. S. have their requirements fairly well covered for a while and are at the moment in anything but a receptive mood regarding purchases against other than actual requirements, it is believed that in their anxiety to secure pulp for winter needs to be shipped out of Sweden prior to the closing of the Baltic papermakers will pay higher prices to guarantee them getting the pulp wanted.

Imports of wood pulp into the United States continue on a fairly high level. In July a total of 73,567 net tons of chemical pulp was imported, compared with 89,962 tons imported in the preceding month, and bringing the total importations for the first seven months of 1923 up to 595,916 net tons. Imports of ground wood in July amounted to 15,514 net tons, making a total for the first seven months of this year of 150,660 net tons.

Most current sales of bleached sulphite are around a price basis of 4.25 cents a pound ex dock New York or other American Atlantic ports for No. 1 grade. Sales down to 4 cents, however, have been made, while bleached sulphite of extra quality is quoted at 4.50 cents and even higher. No. 1 unbleached sulphite is selling at an average of 3.25 c pound ex dock New York, with quotations ranging down to 3.15 and up to 3.50 cents. Kraft pulp of No. 1 grade is quoted at 3 to 3.25 cents a pound on the dock at New York, though in exceptional cases importers are said to have sacrificed stocks at less than 3 cents. High prices prevailing on ground wood have enabled importers to compete, and sales of foreign gound wood at around $47 a ton ex dock New York have been reported.

Receipts at the port of New York in September and current market quotations ex dock New York follow:

Bleached sulphite, No. 1.....	$ 4.00- 4.50
Unbleached sulphite, No. 1.....	3.15- 3.40
Easy bleaching	3.40- 3.65
Mitscherlich unbleached	3.50- 3.75
Kraft	3.00- 3.25
Ground wood, per ton.....	46.00-48.00

Scandinavian Pulp Agency, 127 bls. from Gothenburg; Castle & Overton, 550 bls. from Bremen and 648 bls. from Rotterdam; E. J. Keller Co., 100 bls. from Hamburg and 203 bls. from Bremen; Scholl Co., 619 bls. from Rotterdam; Pagal, Horton & Co., 4,800 bls. from Gothenburg and 4,760 bls. from Gefle; J. Andersen & Co., 2,250 bls. from Greaker; E. M. Sergeant & Co., 1,500 bls. from Greaker; H. Hollesen, 1,545 bls. from Bremen; Johaneson, Wales & Sparre, 350 bls. from Gothenburg, 4,250 bls. from Sundsvall and 1,500 bls. from Harnosand; Woodpulp Trading Co., 2 bls. from Gothenburg; Bulkley, Dunton & Co., 2,000 bls. from Sundsvall and 525 bls. from Gefle; National City Bank, 1,377 bls. from Rotterdam and 510 bls. from Bremen; Mechanics & Metals National Bank, 750 bls. from Greaker and 1,250 bls. from Gothenburg; M. Goftesman & Co., 900 bls. from Rotterdam; Lagerloef Trading Co., 2,550 bls. from Helsingfors, 3,841 bls. from Kotka and 2,618 bls. from Bremen; Kidder Peabody Acceptance Corp., 4,440

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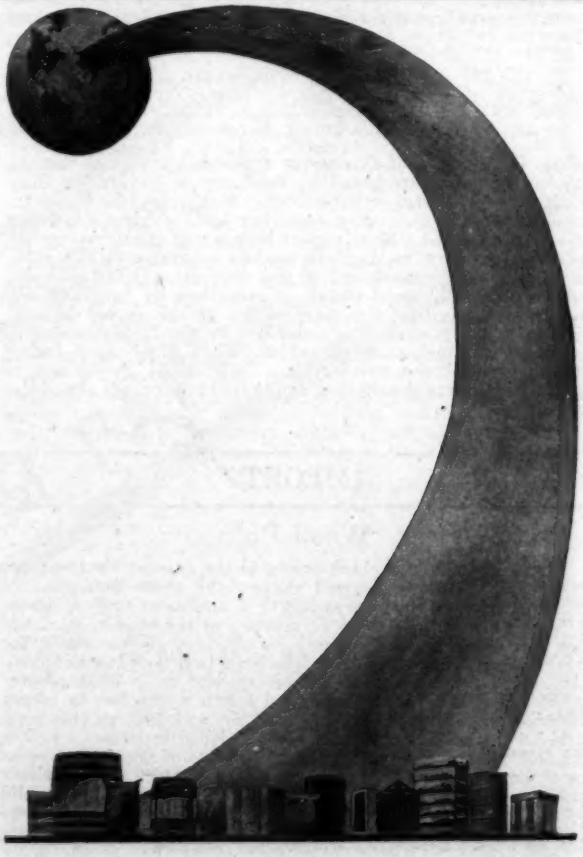

bls. from Christiania and 1,000 bls. from Greaker; American Woodpulp Corp., 800 bls. from Hamburg; Tidewater Paper Mills Co., 9,624 bls. ground wood from Gaspe, 6,538 bls. ground wood from Bathurst and 9,907 bls. ground wood from Point au Pie; Order, 100 bls. from Hamburg.

Paper Stock

The feature in the imports of papermaking material into the United States in September was the marked increase in arrivals of rag stock. Some large shipments of rags of various grades, but mostly low qualities for roofing paper mills, were received, the total arriving at the port of New York easily exceeding that of the several previous months and comparing favorably with any month thus far this year. Old rope imports fell off, and so did receipts of scrap bagging. In fact, aside from rags, imports of paper stock were abnormally small. Arrivals at the port of New York in September and consignees follow:

Old Rope

Brown Bros. & Co., 144 coils and 85 bls. from Antwerp, 30 bls. from Havre, 73 coils and 49 bls. from Hamburg, 94 coils and 7 bls. from St. Nazaire, 190 coils from Hull, 74 coils and 34 bls. from London, and 236 coils from Rotterdam; E. J. Keller Co., 58 bls. from Hamburg; M. Wolfer & Co., 25 bls. from Havana; J. Van Stallic & Co., 61 coils from Rotterdam; N. E. Berzen, 7 bls. from Havana; Equitable Trust Co., 49 bls. from Rotterdam; Ellerman-Wilson S. S. Line, 142 coils from London and 163 coils from Southampton.

Old Bagging

Katzenstein & Keene, 49 bls. from Rotterdam; E. J. Keller Co., 543 bls. from Havre; E. Butterworth & Co., 374 bls. from Hull; Castle & Overton, 105 bls. from Havre; Equitable Trust Co., 213 bls. from Manchester; L. H. Abenheimer, 160 bls. from Rotterdam.

Rags

Daniel M. Hicks, Inc., 37 bls. from Havre; Katzenstein & Keene, 602 bls. from Barcelona, 403 bls. from Rotterdam and 31 bls. from Antwerp; Maurice O'Meara Co., 228 bls. from Hamburg, 383 bls. from Havre, 261 bls. from Bordeaux, 58 bls. from Antwerp and 62 bls. from Rotterdam; Wilkinson Bros. & Co., 35 bls. from Hamburg, 24 bls. from Leith, 52 bls. from Rotterdam and 131 bls. from Hull; Calain Co., 2,000 bls. from Havre; Stone Bros. & Victor Galaup Co., 75 bls. from London, 131 bls. from Havre and 108 bls. from Liverpool; L. H. Abenheimer, 194 bls. from Hamburg and 103 bls. from Rotterdam; Cie Generale Trans, 23 bls. from Havre; G. W. Millar & Co., 302 bls. from St. Nazaire; Kelly & Co., 215 bls. from Antwerp; American Woodpulp Corp., 18 bls. from Havre; Castle & Overton, 4 bls. from Bordeaux, 449 bls. from Smyrna, 46 bls. from Antwerp and 38 bls. from Rotterdam; M. Wolfer Co., 32 bls. from Havana; S. Silberman Co., 362 bls. from London; Albion Trading Co., 14 bls. from Marseilles; G. P. Lotterhand, 4 bls. from Antwerp; Waste Material Trading Corp., 180 bls. from Hamburg; American Express Co., 44 bls. from Leith; R. F. Downing & Co., 34 bls. from Manchester; W. Schall & Co., 396 bls. from Hamburg; P. Berlowitz, 41 bls. from Rotterdam; Salomon Bros. & Co., 33 bls. from Rotterdam; W. Hughes & Co., 106 bls. from Rotterdam; S. Birkenstein & Sons, 113 bls. from Rotterdam; Bank of America, 80 bls. from Hamburg; Coal & Iron National Bank, 165 bls. from Hamburg and 168 bls. from Rotterdam; Mechanics & Metals National Bank, 450 bls. from Hamburg, 396 bls. from London, 317 bls. from Havre and 99 bls. from Manchester; International Acceptance Bank, 443 bls. from Hamburg, 834 bls. from Bristol, 90 bls. from Bremen, 46 bls. from London, 191 bls. from Liverpool, 106 bls. from Newcastle and 358 bls. from Manchester; Manufacturers Trust Co., 87 bls. from Hamburg and 152 bls. from Bremen; Chemical National Bank, 528 bls. from Rotterdam and 424 bls. from Bremen; Guaranty Trust Co., 280 bls. from London, 1,308 bls. from Hamburg, 43 bls. from Havre, 126 bls. from Leith, 155 bls. from Glasgow, 102 bls. from Liverpool, 321 bls. from Manchester and 181 bls. from Rotterdam; New York Trust Co., 129 bls. from Bremen, 348 bls. from Leghorn, 21 bls. from Havre and 613 bls. from Antwerp; Columbia Bank, 457 bls. from Dunkirk; Equitable Trust Co., 18 bls. from Dunkirk, 69 bls. from Havre, 34 bls. from Bordeaux and 44 bls. from Marseilles; Irving Bank-Columbia Trust Co., 501 bls. from Marseilles, 43 bls. from Rotterdam and 26 bls. from Manchester; Goldman, Sachs & Co., 165 bls. from Hamburg, 106 bls. from Bordeaux and 128 bls. from Bremen; Brown Bros. & Co., 233 bls. from Hamburg, 1,173 bls. from Antwerp, 1,126 bls. from Bristol, 456 bls. from London, 74 bls. from Liverpool, 168 bls. from Havre and 82 bls. from Glasgow; Cleveland Trust Co., 698 bls. from Marseilles; Order, 217 bls. from London, 1,475 bls. from Antwerp, 136 bls. from Liverpool, 85 bls. from Hamburg, 25 bls. from

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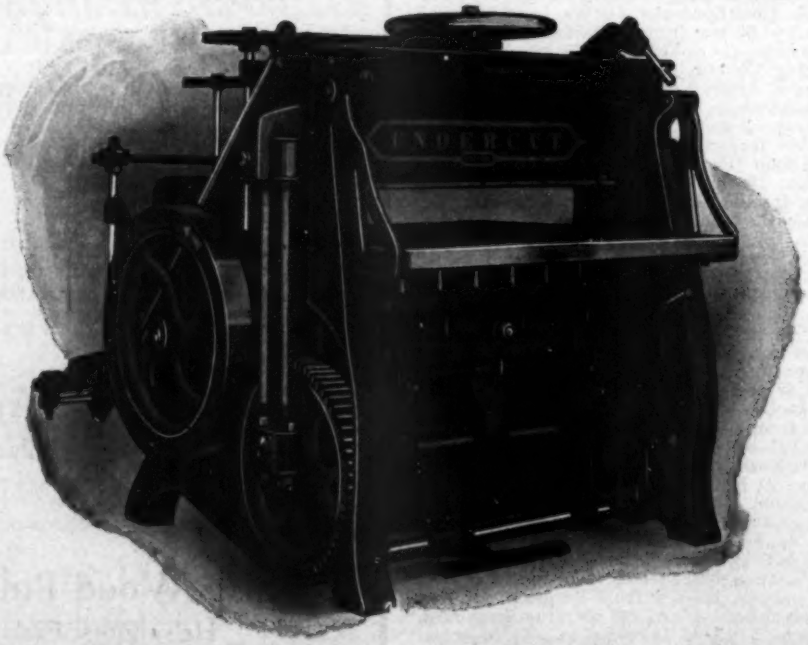

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Miscellaneous Paper Stock

E. J. Keller Co., 365 bls. from Antwerp; Brown Bros. & Co., 89 bls. from Glasgow; Equitable Trust Co., 79 bls. from Hamburg and 111 bls. from Dundee; Irving Bank-Columbia Trust Co., 250 bls. from Antwerp; International Acceptance Bank, 20 bls. from Havre; W. Schall & Co., 122 bls. from Hamburg; Maurice O'Meara Co., 65 bls. from Dundee; Bankers Trust Co., 229 bls. from Dunkirk; Patterson National Bank, 133 bls. from London; Order, 506 bls. from Antwerp, 5 bls. from Dundee and 10 bls. from Manchester.

Paper

Paper imports into the United States in July, 1923, amounted in value to a total of $9,145,907, compared with imports valued at $6,620,570 in July last year, according to Government figures. Imports of paper for the seven months ended July 31 last showed an appreciable increase over the same period a year ago, totaling in value $66,268,919, contrasted with imports valued at $46,688,898 in the corresponding period last year.

Imports of paper into the U. S. during September were of about normal volume, judging from unofficial figures taken from manifests of steamers arriving at the port of New York. There were some fair-sized shipments of news print received, while imports of wrapping paper from Scandinavian and German sources were fully up to recent months. Usual amounts of cigarette, filter, hanging and other kinds of paper also were imported. Receipts of paper of all kinds through the port of New York in September follow:

Cigarette

P. J. Schweitzer, 180 cs. from Antwerp; Miquel & Costas, 10 cs. from Barcelona; British-American Tobacco Co., 40 cs. from Havre; Zorro Tobacco Co., 24 cs. from Lisbon; Rose & Frank Co., 152 cs. from Havre; Surbrug Co., 22 cs. from Havre American Tobacco Co., 1,450 cs. from Bordeaux; R. J. Reynolds Tobacco Co., 920 cs. from St. Nazarie; DeManduit Paper Corp., 273 cs. from St. Nazarie; E. Waters, 8 cs. from Marseilles; Order, 11 cs. from Constantinople.

Printing

Chemical National Bank, 1,164 rolls from Hamburg and 886 rolls from Sundsvall; P. Puttmann, 15 cs. from Antwerp; E. Dietzgen & Co., 53 cs. from Hamburg; Perry, Ryer & Co., 138 cs. from Glasgow; Guaranty Trust Co., 89 rolls from Hamburg; C. K. MacAlpine & Co., 106 rolls from Rotterdam; Irving Bank-Columbia Trust Co., 217 rolls from Trieste; B. F. Drakenfeld & Co., 55 cs. from Liverpool; Oxford University Press, 10 cs. from Liverpool; Wilkinson Bros. & Co., 21 bls. from Antwerp; P. C. Zuhlke, 11 cs. from Glasgow and 82 cs. from Hamburg; Bank of America, 48 rolls from Sundsvall; Gary Printing & Publishing Co., 112 rolls from Christiana; P. H. Petry & Co., 13 cs. from Rotterdam; Il Progresso d'Italiano, 20 rolls from Aberdeen; Newsprint Paper Corp., 129 rolls from Gothenburg; American Exchange National Bank, 258 rolls from Christiania; Fourth & First National Bank of Nashville, 80 rolls from Hamburg; Order, 472 rolls from Hamburg, 8 bls. from Glasgow, 173 rolls from Christiana, 1,672 rolls from Gothenburg, 164 rolls from Sundsvall, 1,886 rolls from Copenhagen, 556 rolls from Bremen, 200 rolls from Kotka and 21 from Christiania.

Wrapping

J. P. Heffernan Paper Co., 647 bls. from Gothenburg and 504 bls. from Hamburg; Union Trust Co., 47 bls. from Antwerp; American Exchange National Bank, 90 bls. from Antwerp; Chemical National Bank, 111 bls. from Gothenburg, 35 bls. from Norrkoping and 1,138 bls. and 856 rolls from Hamburg; Chatham & Phenix National Bank, 447 rolls and 24 bls. from Gothenburg and 22 rolls from Hamburg; Wilkinson Bros. & Co., 472 rolls and 478 bls. from Hamburg and 522 rolls and 162 bls. from Rotterdam; W. Hartman & Co., 984 bls. and 1,352 rolls from Hamburg; C. Steiner, 455 bls. from Rotterdam; C. D. Stone & Co., 36 cs. from Rotterdam; Bernard, Judae & Co., 12 bls. from Rotterdam and 56 bls. from Hamburg; Republic Bag & Paper Co., 168 rolls from Hamburg; E. Dietzgen & Co., 5 cs. from Hamburg; New York Trust Co., 346 bls. from Trieste; Equitable Trust Co., 539 rolls from Copenhagen; Falsing Paper Co., 391 bls. from Hamburg; F. B. Vandegrift & Co., 105 bls. from Hamburg; International Acceptance Bank, 137 bls. from Hamburg; R. Cushman & Co., 3 cs. from Genoa; Blauvelt-Wiley Paper Mfg. Co., 48 rolls from Hamburg and 26 bls. from Glasgow; National City Bank, 602 bls. from Hamburg and 10 bls. from Norrkoping; D. S. Walton & Co., 3,951 rolls and 101 bls. from Gothenburg and 2,009 rolls from Norrkop-

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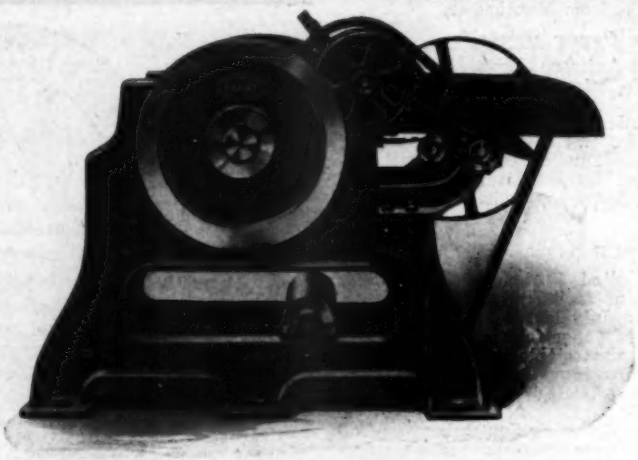

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ing; Melby, Kuttroff & Co., 2,235 bls. from Gothenburg; Bendix Paper Co., 10 cs. from Hamburg; Peoples Trust Co., 1,786 rolls and 17 bls. from Gothenburg; Irving Bank-Columbia Trust Co., 553 rolls and 29 bls. from Gothenburg and 127 bls. from Hamburg; Arkell Safety Bag Co., 123 rolls from Gothenburg; Corn Exchange National Bank, 1,550 rolls and 61 bls. from Gothenburg and 449 rolls from Hamburg; Hensel, Bruckman & Lorbacher, 2 cs. from Southampton and 16 cs. from Hamburg; Import Paper Co., 10 cs. from Hamburg and 100 cs. from Rotterdam; Standard Underground Cable Co., 66 rolls from Glasgow; Guaranty Trust Co., 47 rolls from Hamburg; P. Aquirre, 200 bls. from Rotterdam; H. S. Chalphant, 62 rolls from Norrkoping; U. S. Steel Products Co., 32 rolls from Hamburg; Ladenburg, Thalman & Co., 1,380 bls. from Hamburg; A. W. Fenton, 5 bls. from Hamburg; Order, 2,603 rolls and 417 bls. from Gothenburg, 1,112 bls. and 6,992 rolls from Hamburg, 98 bls. from Trieste, 530 bls. and 557 rolls from Bremen, 799 rolls and 11 bls. from Norrkoping, and 404 rolls and 939 bls. from Kotka.

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H. Reeve Angel & Co., 3 cs. from Southampton; J. W. Hampton Jr. & Co., 5 cs. from Rotterdam and 31 cs. from Hamburg; E. Dietzgen & Co., 16 cs. from Marseilles; Publicity Paper Corp., 3 cs. from Hamburg; F. L. Kraemer & Co., 20 cs. from London; C. Steiner, 42 cs. from Bremen; R. F. Downing & Co., 7 cs. from Southampton; Order, 43 cs. from Trieste.

Drawing

Favor, Ruhl & Co., 10 cs. from London; H. Reeve Angel & Co., 2 cs. from London; E. Dietzgen & Co., 193 cs. from Hamburg and 60 cs. from Rotterdam; Keuffel & Esser Co., 9 cs. from Liverpool, 54 cs. from Hamburg and 6 cs. from Rotterdam; Order, 8 cs. from Hamburg.

Filter

E. Fougera & Co., 73 cs. from Southampton; H. Reeve Angel & Co., 28 cs. from London and 9 cs. from Southampton; American Express Co., 45 bls. from London; Orbis Products Trading Co., 15 bls. from Bordeaux; A. Giese & Son, 30 bls. from Bordeaux; Bernard, Judae & Co., 10 bls. from Bordeaux and 2 cs. from Gothenburg.

Tissue

Iwai & Co., 25 cs. from Kobe; F. C. Etrype, 18 cs. from Liverpool, 22 cs. from Marseilles and 2 cs. from London; Meadows, Wye & Co., 10 cs. from Liverpool; Pitt & Scott, 5 cs. from Southampton.

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Gevaert Co. of America, 107 cs. from Antwerp; M. Schneider, 2 cs. from Hamburg; M. G. Lange & Co., 200 cs. from Rotterdam; Lithophone Co., 3 cs. from Antwerp; Globe Shipping Co., 576 cs. from Bremen; F. Henjes, Jr., 11 cs. from Bremen.

Hanging

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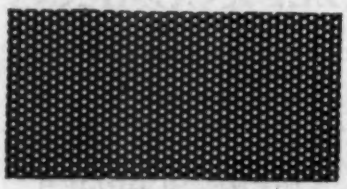
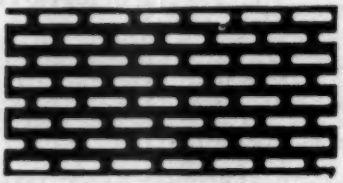
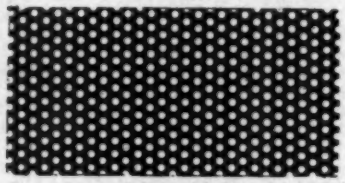


.065 inch round



1/4 x 3/4" Slots



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Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 7569—Paper bags. Panama, Republic of Panama. Agency desired.

No. 7529—Paper for printing transfers for designs on gowns. Sydney, Australia. Purchase desired.

No. 7724—Bank note paper, watermarked. Buenos Aires, Argentina. Purchase desired.

No. 7748—Machine finished and super calendered book paper, and news print paper, 600 tons. Karachi, India. Purchase desired.

No. 7651—Card board (vulcanized fiber). Geneva, Switzerland. Purchase desired.

No. 7585—Casing paper, one side glazed. Bombay, India. Purchase desired.

No. 7641—Filter paper, 3 tons per month. Alexandria, Egypt. Purchase desired.

No. 7581—Paper of various kinds. China. Agency desired.

No. 7620—Paper in rolls of 1,000 meters for sensitized photographic paper. Antofogasta, Chile. Purchase desired.

No. 7618—News print paper. Sofia, Bulgaria. Purchase desired.

No. 7819—Machinery for paper bag making. Concepcion, Chile. Purchase desired.

No. 7859—Paper board for railway car lining. Sydney, Australia. Purchase and agency desired.

August Newsprint Statistics

The following are statistics for the month of August as compiled by the News Print Service Bureau of New York.

"The 68 reporting companies produced 247,325 tons and shipped 243,128 tons during August. Production exceeded shipments by 4,197 tons. Production figures include 2,415 tons of hanging, of which 1,137 tons were made in Canada.

Comparing production of 51 identical companies during the first eight months of 1923 with that of the same period of 1922, the United States companies show an increase of 76,953 tons or 9 per cent, the Canadian companies an increase of 137,405 tons or 19 per cent and the total of all these companies shows an increase of 214,358 tons or 14 per cent.

The average daily production of news print paper by these 51 companies reporting for August amounted to 97.5 per cent of the average daily output during the three months of greatest production in 1922, with allowances for changes in machines.

Stocks of the same companies during August increased 2,852 tons at mill points in the United States and 704 tons in Canada. Total stocks of these reporting mills amounted to 37,183 tons or 3,556 tons more on August 31 than on July 31. These stocks are equivalent to 4.3 days' average production, about 18 per cent of which was at British Columbia mills that ship by water.

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